OCCUPATIONAL MEDICINE FIELD OPERATIONS MANUAL

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CHAPTER 1

INTRODUCTION

Purpose

The purpose of this manual is to provide guidance and direction for conducting Navy Occupational Medicine Programs in a single source document.

Applicability

This manual is for use by all Navy medical personnel who provide occupational medicine services. It applies to all Navy military and civilian personnel. However, the limitations inherent to uniquely military operations will require flexibility in implementation of medical surveillance requirements for forces afloat.

Scope

This manual provides guidelines for standardizing Navy occupational medicine. It is intended to assist medical personnel in the development and day-to-day operation of local occupational medicine programs. It is also intended to assist type commands in the monitoring of occupational medicine programs under their cognizance. This manual is intended to complement and clarify, but not replace, applicable Navy instructions and well-established occupational health programs, such as radiation health and industrial hygiene, which are referenced in the appropriate sections.

Background

Section l9(a) of the Occupational Safety and Health Act of 1970 (OSHAct) requires heads of federal agencies to establish and maintain an occupational safety and health program which provides its employees the occupational safety and health standards and protection that the OSHAct affords civilian employees in the private sector. The Navy Occupational Safety and Health (NAVOSH) Program has adopted standards equal to, or more stringent than those promulgated by the Department of Labor, Occupational Safety and Health Administration (OSHA) for the private sector, with exceptions for (a) military unique equipment, systems and operations; (b) conditions governed by other statutory authorities; and (c) overseas, for conditions governed by international agreement.

Bureau of Medicine and Surgery policy is that all medical activity commands shall provide required occupational health services to supported activities, afloat and ashore, to ensure a safe and healthful work environment for all personnel. The goal of the occupational health program is to provide employees protection in the workplace. The main sources of the NAVOSH standards used in occupational health programs are the following:

1. OSHA standards. These are published in the Code of Federal Regulations and the Federal Register.

2. Department of Defense and Department of the Navy instructions. Where OSHA standards exist, NAVOSH standards are consistent with, or exceed OSHA standards. In cases where NAVOSH standards are not in conformance with the most recent OSHA standards, the latter are used as interim NAVOSH standards.

3. Alternate Department of Defense standards approved under Executive Order

12196.

4. Nationally recognized sources of occupational safety and health guidance, such as the American Conference of Governmental Industrial Hygienists (ACGIH) and the American National Standards Institute (ANSI).

5. Office of Personnel Management (OPM) which sets medical qualification requirements for federal civilian employees in certain positions.

6. Other federal agencies, such as the Department of Transportation, which may require physical examinations for personnel performing specific duties.

Note: The references cited in this manual were current at the time of publication. Appropriate changes in procedures must be made when those references are updated.

Objectives

This manual addresses the following objectives:

1. Provide guidance for personnel on their responsibilities as providers of occupational health care.

2. Standardize procedures for medical surveillance and job certification of employees.

3. Provide guidance for occupational health providers on the management of occupational injuries and illnesses.

4. Clarify occupational medicine reporting and recordkeeping requirements.

5. Provide guidance on training and certification requirements for providers of Navy occupational medicine services.

6. Provide a concise bibliography of occupational health resources, references and directives.

CHAPTER 2

OCCUPATIONAL HEALTH PRACTICE

References

NAVMEDCOMINST 1300.1 C. *Suitability Processing for Overseas Assignment of Navy and Marine Corps Members and Their Accompanying Dependents.* 23 March 89.

OCPMINST 12792.4. *Employee Health Promotion and Wellness Program.* 14 Feb 92.

OPNAVINST 5100.23 series. *Navy Occupational Safety and Health Program Manual*.

OPNAVINST 6100.2. *Health Promotion Program.* 25 Feb 92.

SECNAVINST 6420.1 D. *Physical Requirements for Non-submarine Personnel Embarked in Submarines.* 7 April 86.

Naval Aviation Engineering Support Unit Instruction 12339.1. *Navy Civilian Technical Specialist (NCTS) Physical Examination Requirements.* 13 Oct 94.

Introduction

The occupational health (OH) professional plays a critical role in the prevention of work-related injuries and illnesses, and in the promotion of healthy work practices and lifestyles in workers. The practice of occupational health involves a diverse mixture of clinical, epidemiologic, administrative and communicative skills. Medical personnel work closely with industrial hygienists, safety professionals, workers and management in workplace health and safety programs. The scope of practice is broad. An overview of OH practice elements is provided below. Many of these have been expanded into separate chapters or appendices in this manual.

ELEMENTS	SEE ALSO
Worksite evaluation	Chapter 3
Treatment of work-related injuries and illnesses	Chapter 6
Treatment of nonoccupational injuries and illnesses	Chapter 6
Preplacement examinations	Chapter 5
Medical surveillance	Chapter 5
Job certification examinations	Chapter 5
Fitness for duty examinations	Chapter 5
Epidemiology	Chapter 4
Education and training related to OH	Appendix C
Travel medicine	Appendix E
Health promotion	
Consulting to management	
Risk communication	
Employee counseling/referral to employee assistance programs (EAP)	

Trend Analysis/Epidemiology

The primary goal of OH is the prevention of work-related injuries and illnesses. OH professionals use epidemiological tools to identify trends in the

occurrence of injuries and illnesses in their worker population, and then communicate the results of trend analysis to safety, management, industrial hygiene and workers so that preventive efforts may be implemented. This is discussed further in Chapter 4.

Worksite Evaluations

OH professionals should become familiar with the worksites in their areas. Visits to the worksite are often invaluable when making recommendations regarding restricted duty or during a fitness for duty evaluation. Worksite evaluations are often necessary for the review of potential exposure related hazards. Team evaluations performed in concert with IH or safety professionals are strongly encouraged. See chapter 3 for details.

Preplacement examinations

OH clinics will be asked to examine applicants for certain positions. The use of preplacement examinations for certification programs and medical surveillance will be described in more detail in Chapter 5.

The Rehabilitation Act of 1973, as amended, includes sections that impact on preplacement examinations. Elements of this law are very similar to the Americans with Disabilities Act, which does not cover federal worksites. This will be discussed further in Chapter 5.

Medical Surveillance

Medical surveillance refers to the application of medical screening tests to individuals and groups of workers with chemical or physical exposures, for the purpose of identifying trends in the occurrence of occupational illnesses and injuries. To be effective, surveillance must be directly linked to preventive action. This requires the use of trend analysis and other epidemiological tools, which are described further in Chapter 4. Details on medical surveillance programs are included in Chapter 5.

Shore based OH clinics must provide medical surveillance services for operational forces including ships and fleet marine force (FMF) since operational forces frequently do not have the equipment and expertise to complete all medical surveillance evaluations. Examples of services includes spirometry, x-ray, laboratory tests, audiology, and OH consultation.

Job Certification

Job certification examinations are medical evaluations required by law or instruction for certain occupations or for individuals performing specific work tasks. The examinations are directed at identifying underlying health conditions or limitations that may result in a medical or safety risk to the employee, co-workers or the public. Examples include examinations for respirator wearers and explosive handlers. Details of job certification programs are contained in chapter 5.

Fitness for Duty Examinations

The term "fitness for duty" was formerly used to describe medical examinations required or offered by management as described in 5 CFR 339.302. In the broad sense they include all the examinations performed by the OH clinic. A "fitness for duty" examination is probably most familiar to OH professionals in the setting where an employee was required to submit to a medical examination

because there was a question about the employee's continued capacity to meet the physical or medical requirements of a position.

Worker fitness and risk evaluations are integral to all OH medical examinations performed. These include evaluations of a worker's ability to perform specific job tasks as well as risk to the worker from physical and chemical hazards. There are many issues involved with these determinations which are discussed further in Chapter 5.

Treatment of work-related injuries and illnesses

OH clinics have varying capacities to provide care for job related injuries and illnesses. Civilian employees are entitled to choose their provider, and although they may choose a private physician, the option to choose the OH clinic should always be available. OH clinics are ideal for care and treatment of work-related injuries and illnesses. Additionally, the OH clinic has the responsibility to oversee the workers' ability to return safely to work, regardless of whether the worker chooses a private physician or accepts the care of the OH clinic. There are many advantages to providing "in-house" injury care, including better trend analysis of workplace injuries as part of a prevention program, generally greater convenience for the employee, and reduced costs to the command and the government. Where available, "in-house" care may extend to treatment by Navy specialists such as orthopedic surgeons and ophthalmologists, or services such as physical therapy.

Active duty sick call and acute care departments, including shipboard medical departments and battalion aid stations are generally the sources of care for treatment of work-related injuries in active duty personnel. OH professionals are a valuable source of consultation for trend analysis of work related injuries and illnesses, as well as evaluation and management of exposure related events. OH professionals need to maintain a close working relationship with other medical providers and provide training in the recognition of work-related conditions, and the follow-up of potential workplace hazards which may place other employees at risk. This includes obtaining assistance from industrial hygienists and safety officers.

Treatment of Nonoccupational Illnesses and Injuries

OH clinics should offer medical services to employees that reduce the time they need to spend away from work for nonoccupational illnesses/injuries and simple medical screening. In addition to reducing time off the job, these services are often more convenient for employees, and provide OH professionals with additional opportunities for health promotion initiatives. Examples of such services include dressing changes or suture removal after a nonoccupational injury, or blood pressure checks for individuals with hypertension. These services can often be coordinated with the employee's primary care provider.

Health Promotion

OH professionals have many opportunities to integrate health promotion into clinic practice. All contact with patients for injury care or medical screening are opportunities to review such areas as smoking cessation, weight reduction, hypertension control, nutrition and exercise. Abnormal results of spirometry performed as part of an OH examination often provide added support for recommendations to quit smoking. Laboratory tests may demonstrate abnormalities related to alcohol abuse, which should lead to counseling and referral.

The scope of health promotion initiatives sponsored/supported by a particular OH clinic will vary based on the size of the supported activity, the supported command's intrinsic health promotion assets, and the contribution of an MTF health promotion office, if available. However, per OPNAVINST 6100.2, all

Naval activities shall establish a health promotion program incorporating at least the following seven elements: alcohol and drug abuse prevention; physical fitness and sports; tobacco use prevention and cessation; nutrition education and weight control; stress management and suicide prevention; hypertension screening, education and control; and back injury prevention.

Per OCPMINST 12792.4, civil service employees of Naval activities are authorized to participate in command health promotion initiatives, within the limitations outlined in OPNAVINST 6100.2 and other applicable directives. Accordingly, all OH clinics should support command health promotion initiatives to the greatest extent possible. OH personnel should work closely with their command health promotion officer in the delivery of these and other services. Potential examples of OH support include: offering blood pressure screening, providing lectures on health-related topics, offering/assisting in cholesterol screening, and coordinating/offering smoking cessation classes.

Travel Medicine

In many cases, the OH clinic (particularly overseas) has the opportunity and resources to be best qualified to provide travel medicine consultations. These may include consultation concerning military or civilian personnel traveling on extended unit deployments, individual military or civilian personnel traveling by themselves or in small groups for assist visits, and personnel and their families on recreational travel to third world locations. Feedback from travelers in the above categories can be an excellent resource for future travelers and for providing information for Navy Environmental and Preventive Medicine Units to review.

Overseas medical screenings are described in NAVMEDCOMINST 1300.1 C. In addition, SECNAVINST 6420.10 requires workers who deploy aboard submarines to undergo periodic certification examinations. Naval Aviation Engineering Support Unit Instruction 12339.1 requires their technical specialists to undergo a similar certification process due to the likelihood of deployment aboard ships or to remote overseas locations. Travel medicine is discussed in detail in Appendix E.

Consultation to Management and Employees

OH professionals are the major source of assistance and information to commanding officers, supervisors, managers, safety professionals, human resource officers, unions and employees on health-related issues in the workplace. One major area of consultation is workers' compensation cost containment and injury prevention programs, which is described in detail in Chapter 6. OPNAVINST 5100.23D requires OH programs to provide medical review and management of workers' compensation cases. Other examples include placement of employees with limitations, interpretation of medical information from private physicians, ergonomics, risk communication to employees, evaluation of health hazards in the workplace, health promotion, environmental issues, disaster planning, and emergency response planning.

In order to provide the most valuable consultation, OH professionals must be familiar with the work tasks that employees perform. Frequent and routine visits to the worksite and meetings with managers and supervisors should be arranged. Safety managers will often assist in making these arrangements.

OH staff should participate in the quarterly occupational safety and health (OSH) policy council meetings and lost-time injury roundtables at supported commands. Many commands have quality management boards (QMBs) and process action teams (PATs) which focus on OSH related issues and can benefit greatly from the

expertise of OH professionals (e.g., back-injury prevention QMB, PAT evaluating the impact of job transfers on OSH programs).

Risk Communication

OH professionals are routinely involved in communicating risk to individuals or groups of workers with exposure related health concerns, such as reproductive health concerns or asbestos exposure incidents. Almost all medical surveillance examinations include some element of risk communication. OH professionals are also involved in environmental/community health concerns, especially exposures related to hazardous waste sites, or at installations with superfund sites. Accordingly, formal courses in risk communication are strongly recommended for OH professionals.

Education and Training

OH professionals are an integral part of the occupational safety and health education of workers. Informal training is routinely performed during clinic encounters with workers. As such, OH professionals must be familiar with the hazards present in the work tasks they support so that they can answer health related questions from workers. OH professionals should also support formal training programs at the worksite such as programs for health promotion, bloodborne pathogens, and health effects of hazardous exposures.

OH professionals should also provide regular training in OH topics to other medical department personnel. A few examples include workplace hazards, treatment and tracking of work related injuries and illnesses, and regulatory and administrative requirements of OH programs.

Employee counseling/referral to employee assistance programs (EAP)

OH professionals are in a unique position to recognize employees with personal, family, or substance abuse problems. The points of contact for EAP for civilian employees and the mechanisms for referral should be identified. In addition, community resources for problems not handled by EAP should be identified. Referral sources for active duty personnel include the command Drug and Alcohol Program Advisor (DAPA) and Navy Family Services Centers.

Occupational Health Staffing

A large variety of medical department personnel are involved in the delivery of OH services. The staffing of individual clinics vary greatly depending on the size and complexity of the program. This can range from a large shipyard clinic with full-time physicians, occupational health nurses (OHNs), technicians, clerical staff, audiologists, optometrists and administrative staff, to a small shipboard medical department with an independent duty corpsman (IDC) or medical department representative. The ideal physician and nurse staffing of shore-based OH clinics is based on formulas in OPNAVINST 5100.23 series.

The roles of these various professionals vary greatly depending on the size and complexity of the OH program. All will be involved to some degree in the areas described under OH practice. Regardless of the size of the OH clinic, all clinics should designate an OH program manager. This individual is responsible for the overall OH program, including clinic or department operation, coordination of medical surveillance programs, interface with other OSH professionals such as safety and industrial hygiene, and establishing quality improvement (QI) and trending activities. For many shore clinics, the OHN serves in this capacity. Afloat or FMF medical departments will usually designate a preventive medicine

technician (PMT), independent duty corpsman (IDC) or general duty corpsman to perform this function.

OH clinics may have full or part-time physicians. They may be residency trained, board-certified occupational medicine (OM) physicians, other medical specialties, general medical officers, flight surgeons, undersea medical officers or others. The use of nonphysician health care providers in the delivery of OH services is discussed in Appendix B.

All OH clinics should identify an OM specialist they can call for consultation. Many are located at large Naval hospitals, shipyard clinics, or the Navy Environmental Health Center(NAVENVIRHLTHCEN). Assistance in locating an OM specialist for consultation is available from NAVENVIRHLTHCEN.

CHAPTER 3

WORKSITE EVALUATION

Introduction

Routine onsite evaluation of the workplace by qualified occupational health professionals provides an essential element of any comprehensive occupational safety and health program. Per section 0802.2 of OPNAVINST 5100.23 series, an annual survey of each workplace is to be made by the cognizant industrial hygienist - i.e., the walk through survey for all potentially hazardous Navy work centers. The survey should contain a description of the work operations and work practices, a list of known hazardous materials, a list of potential physical and biological hazards, and a description of existing controls and their efficiency.

In addition, onsite workplace evaluation may be performed by occupational health (OH) nurses and/or physicians in a number of situations: in response to a specific employee's complaints or concerns, to investigate an apparent cluster of pattern of related complaints in two or more employees, or as part of a periodic worksite inspection schedule.

Worksite Visit Preparation

In preparation for a scheduled worksite visit, OH professionals should familiarize themselves with all relevant data. Such data may include, but should not necessarily be limited to:

1. Review of the most recent industrial hygiene (IH) survey report for the work center, and if applicable, the corresponding medical surveillance recommendations for the employees in the work space.

2. Results of physical, biological and chemical hazard assessment, such as noise dosimetry and airborne chemical sampling under the annual workplace monitoring plan.

3. Assessment of the presenting complaint(s) of the affected employees who have been evaluated in the cognizant OH clinic.

4. Reports of the periodic safety departmental inspections of the workplace, and injury/illness data for the work center's employees, particularly when clusters of similar illnesses/injuries or adverse trends in their number or severity has occurred in the worksite. The command occupational safety and health officer, per OPNAVINST 5100.23 series, is responsible for maintaining trend analysis reports.

Worksite Inspection

The inspection itself should be coordinated with the cognizant work center supervisor. While the scope of the evaluation is certainly dictated in part by the specific reason for the visit, some general principles apply for most worksite evaluations by OH personnel.

1. An essential element of the evaluation is the assessment of work practices, identification of physical, biological and/or chemical hazards, and use of personal protective equipment (PPE). It is particularly helpful to have a summary of the recommended PPE from the most recent IH survey available at the time of the visit to ascertain whether the recommended protection is in use.

2. If a particular employee complaint is being investigated, the specific circumstances surrounding that complaint should be thoroughly evaluated.

3. Sufficient time for the site visit should be allotted for "oh by the way" which inevitably arise whenever the physician or nurse make a visit. If feasible, visits should be made without command representatives, thereby fostering a freer exchange between shop personnel and OH professionals.

Documentation of the Worksite Visit

Sufficiently thorough documentation of the visit is important. The following subject areas are from the format utilized at the National Naval Medical Center for site visit documentation, although many other formats could be utilized:

1. Operation/Worksite:
2. Point of Contact:
3. Findings/Discussion:
4. Recommendations:
5. Action:

Follow-up of the Worksite Visit

The specific nature of the appropriate follow-up for a worksite visit is, of course, dependent on the scope and reason for the evaluation. For example, if an employee complaint is the triggering event, a written report or debriefing session should be arranged to explain the results of the worksite evaluation to that individual. If the visit was part of an injury trend analysis, any identified safety/health hazards should be reported to the cognizant work center supervisor(s), the activity occupational safety and health officer and, if applicable, the industrial hygienist, for appropriate correction.

Regardless of the reason for the visit, a follow-up (at a minimum a phone call to the particular employee and supervisor) is a must. This protocol demonstrates command concern and instills a sense of well being in the employees and reinforces the availability and interest of the OH department. As a result of the site visits, future employee problems and concerns will be brought to medical attention prior to actual injury or illness. The information obtained can be utilized to alert appropriate OSH personnel of potential areas of concern, in a manner which help protect employees from real or perceived risk of management reprisal for directly reporting workplace hazards to management.

CHAPTER 4

EPIDEMIOLOGY AND TREND ANALYSIS

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White MR, McNally MS. Morbidity and Mortality in US Navy Personnel from Exposures to Hazardous Materials. *Milt Med*. 1991;156:70-73.

Introduction

One of the greatest challenges to occupational health (OH) clinical providers is to develop meaningful public health interventions based on their clinical and laboratory observations. This requires interaction with many other disciplines including industrial hygienists, safety professionals, radiation health officers and preventive medicine technicians. Only with a multi-disciplinary approach can the clinical workload of the occupational health clinic result in improvements to the health and safety of the work force as a population.

The use of epidemiology as a public health tool is required in several areas of OPNAVINST 5100.23 series including:

1. The development of an occupational exposure registry and data bank - this is the product of identification of hazards by the industrial hygiene (IH) program and the results of medical surveillance examinations (section 0802.5).

2. The review of worker medical data in aggregate to "detect unrecognized occupational hazards and assess the effectiveness of the occupational medicine program" (section 0803.1(b)(9)).

In most Navy and Marine Corps settings, the opportunity to review and collect medical data has not been fully realized. Large, centrally managed Occupational Health Management Information Systems have proved too cumbersome to be useful to the resource sponsor, functional managers or individual OH clinics. This chapter will discuss options available to occupational health care professionals who wish to develop an epidemiological approach to improve both the health of the work force and the quality of services provided.

Epidemiological Approach to Prevention

Prevention of illness and injury should be the underlying goal of all OH

clinical efforts. If this goal is not attempted, what is referred to as a medical surveillance program results in only a screening process without the evaluation and intervention steps. Population-based epidemiological analyses may be used at any of the three levels of prevention:

1. Primary prevention - the modification of the workplace to prevent disease prior to exposure. This is the underlying goal of industrial hygiene (IH) surveys. Primary prevention requires an active interaction between the IH and OH programs. IH surveys and walk-throughs should drive the medical screening program. Use of OH demographic data and information obtained from the following questions can be useful to the IH and safety professional:

(a) Who is being referred for OH services by command and workplace?

(b) Have there been changes in OH patient patterns that might indicate a change in work process or production level which may require an IH re- evaluation? This may also be the first indication of a change in command emphasis on NAVOSH programs or assignment of a different safety officer.

(c) Are there changes to occupational injury or illness patterns that reflect a degradation of primary prevention strategies such as proper use of engineering controls, administrative practices, or personal protective equipment?

2. Secondary prevention - the detection of a disease state at a point where it can be reversed. Secondary prevention can occur at several levels:

(a) Evaluation of the individual worker - based on the potential chemical, biological and physical hazards to which the worker may be exposed, physical examinations and laboratory tests may indicate a potential disease. It is important to compare the worker's results to established normal values and the worker's last evaluation. The majority of workers will have "normal" results. This is commonly referred to as the "the healthy worker effect". The observed decline in laboratory studies may be more pronounced in an exposed worker than the expected change over time in a non-exposed worker, although the values may still be "normal". This is demonstrated in figure (1). In this way, each worker is used as his own control for comparison over time, in addition to the published normal values. An example is tracking spirometry test results for change over time to look for reduced lung function.

(b) A similar problem is how to approach an asymptomatic worker with mildly "abnormal" laboratory values. Specific algorithms have been developed, as in figure (2), to evaluate workers with laboratory tests outside the published normal values.

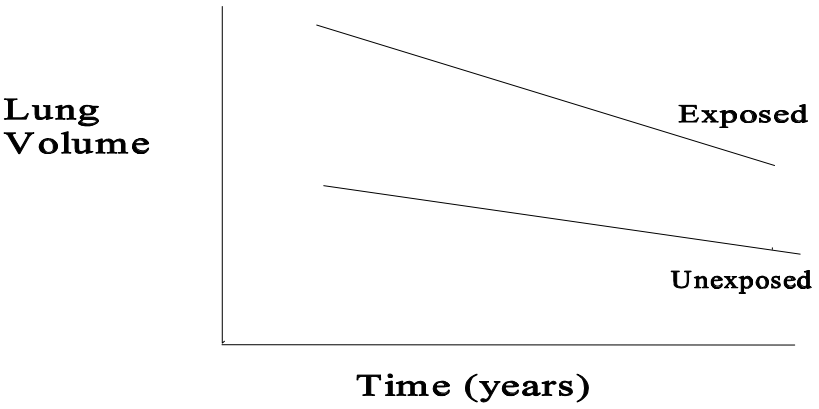

Fig. 1. When is "normal" not normal? Lung Function of exposed vs unexposed workers. From: Silverstein MA. Medical Screening, Surveillance and the Prevention of Occupational Disease. Reprinted with permission.

(c) Another area that has the potential for epidemiological investigation of screening results is biological monitoring. Workers' exposures are assessed by collecting samples (most commonly blood or urine) which are then measured for a hazardous agent or a metabolite. This has the advantage over IH air sampling because it takes into account the workers' exposures, not only through inhalation, but also across the skin or by ingestion (due to poor work practices). The data can easily be analyzed by workplace to determine any overexposures or changes over time. The OSHA cadmium standard (29 CFR 1910.1027) specifically outlines this approach with threshold values for either urine or blood cadmium results. Within two weeks of obtaining an elevated cadmium result, a reassessment of the worker and workplace is required. Although not required by OSHA, a similar occupational health and industrial hygiene biological monitoring threshold approach could be used with blood leads or other heavy metal determinations. This can be a useful tool for the IH department with multiple taskings and limited resources to identify workplaces that should be prioritized for evaluation.

(d) The next step in secondary prevention is the collection of individual worker data, either from medical surveillance examinations or biological monitoring. This information is then evaluated by both specific worksite and by areas of similar potential hazard exposure, asking these types of questions:

(1) Are there collections of "abnormal" results among workers in a specific workplace?

(2) Are there differences among workers with similar potential exposures compared to other work sites?

(3) Are there any changes over time in the number or location of

these abnormalities?

(4) How do any of these observations compare to the IH data?

3. Tertiary prevention: the improvement of the disease or disability condition. Although tertiary prevention is the least advantageous approach to the individual worker, important information for the development of workplace preventive strategies can be obtained. Examples of this approach include:

(a) The development of occupational health sentinel events that require a reevaluation of hazards, exposures, and work practices. Examples are a list of 64 occupational events, such as hepatitis A in a day care center worker, or contact or allergic dermatitis in a boat building or repair worker (Mullen and Muthy).

(b) Another tertiary preventive approach is the expansion of potential sites to look for occupational injuries and illness treated by primary care providers (including afloat and ashore military sick calls). Patients treated at these sites may not be recognized as having an "occupational" illness or injury, or may not be referred to an OH clinic. Personal interaction with safety professionals, emergency room staff, and physical and occupational therapists may allow the OH provider to define better the scope of occupational illness and injury seen by medical care providers.

(c) The results of large Navy or civilian work evaluations, released as government reports or published articles, may provide clues to evaluate local workplaces and populations. An example is a study from the Navy Health Research Center (White and McNally) which identified that 1371 hospitalizations and 136 deaths occurred from 1974 to 1985 as a result of exposure to hazardous materials. Specific Navy enlisted rates and ages were identified as being high-risk. While this information cannot be considered current, it might provide a meaningful place to look for potential hazards and opportunities for training in safe work practices.

Sources of Epidemiological Data

Personnel assigned to operational units or military treatment facilities often do not have the manpower, time, or computer resources to perform extensive analyses of the entire universe of potential patients for whom their facility provides OH services. As mentioned previously, service-wide databases have proved too cumbersome to provide meaningful data. Smaller resources do exist including the following:

1. The computerized version of reference NEHC6260 TM96-1, the Medical Surveillance Procedures Manual, is used widely to generate SF-600 facsimile forms for Navy OH medical surveillance programs. This program generates a dBase III Plus (Borland International Inc.) database file (filename employee.dbf) which can be used to produce summary medical surveillance reports for industrial hygienists and command safety officers. A working knowledge of dBase III Plus is required to use this feature. Information on this program is available by contacting the Navy Environmental Health Center (NAVENVIRHLTHCEN) Occupational Medicine directorate or any Navy Environmental and Preventive Medicine Unit NAVOSH department.

2. NAVENVIRHLTHCEN maintains on computer files data from NAVMED 6260/5 and NAVMED 6260/7 of the Navy Asbestos Medical Surveillance Program.

3. A free computer program called Epi-info has been developed by the US Public Health Service Centers for Disease Control and Prevention (CDC). This program was specifically designed for epidemiological analysis and is relatively simple to use. This program reads and can analyze dBase III Plus files generated by the medical matrix computer program. Ordering information can be obtained at (404) 469-4098 or FAX (404) 469-0681.

4. Data on IH samples sent to the regional Navy Consolidated Industrial Hygiene Laboratories are collated by NAVENVIRHLTHCEN and can be requested for a specific location or command.

5. OPNAVINST 5100.23 series lists the mishap and occupational illness and injury reporting requirements that can provide another source of information. This also can produce the side benefit of closer interaction between safety professionals and OH providers.

Conclusion

The use of epidemiological methods affords the OH professional the opportunity to better understand OH customers. From this approach, meaningful public health interventions can be recommended to another set of our customers - the commands that refer us our patients and who are ultimately responsible for the maintenance of a safe and healthy workplace.

CHAPTER 5

MEDICAL EXAMINATIONS

General References

5 Code of Federal Regulations (CFR) 339. ***Medical Qualification Determinations.***

29 CFR 1614.203. ***Rehabilitation Act.***

29 USC 791. ***Rehabilitation Act of 1973.***

COMNAVMEDCOM ltr 6260 Ser 242/0258 of 2 May 88. ***Worker Placement into Medical Surveillance Programs.***

NAVMED P-117. ***Manual of the Medical Department.***

NEHC6260 TM96-1. ***Medical Surveillance Procedures Manual and Medical Matrix*** **(Edition 5).**

OPNAVINST 5100.23 series. ***Navy Occupational Safety and Health Program Manual.***

References for Specific Programs. See Appendix B

Introduction

Evaluation of the health status of an individual exposed to specific stressors or working in certain jobs is essential to achieve a safe and healthful workplace for that individual and his/her coworkers. Certain occupations have medical standards, which are written descriptions of the medical requirements for specific occupations, on the basis that a certain level of health status is required for successful performance in those occupations.

Medical standards and immunization recommendations for specific occupations and exposures are contained in NEHC6260 TM96-1, (Medical Surveillance Procedures Manual and Medical Matrix), NAVMED P-117 (Manual of the Medical Department), and other Navy instructions and federal publications. These apply to military and civilian personnel.

When specific guidance is not available, or when there are no medical surveillance requirements, these may be established through the cooperative efforts of the Navy Environmental Health Center and the Bureau of Medicine and Surgery.

There are specific regulations that apply only to civilian personnel. Regulations cited in this chapter concerning medical issues related to civilian employment are based on the Code of Federal Regulations.

Placement into Medical Surveillance Programs

In accordance with OPNAVINST 5100.23 series, selection of personnel for medical surveillance should be based primarily on the results of industrial hygiene (IH) surveys that quantify exposures in the workplace. This is called "hazard based" surveillance. When IH data is insufficient or not available, individuals are placed in specific programs based on known or presumed qualitative exposures rather than on quantitative IH measurements and known time exposures. As the IH data base grows, personnel can be selectively included in or excluded

from hazard based surveillance. Some "job based" surveillance will likely exist because it may be impossible to adequately quantify worker exposures (examples are firefighters and hazardous waste workers).

Criteria for placement in some medical surveillance programs are mandated by Occupational Safety and Health (OSHA) or Navy regulations. When there is no OSHA or Navy standard for a specific agent, individuals whose jobs are associated with exposures to hazards or stressors above the medical surveillance action level for more than 30 days per year or 10 days per quarter are placed into medical surveillance programs. When there is no legal standard for medical examinations for specific agents, half of a recommended exposure limit may be used as the action level.

Removal from Medical Surveillance Programs

Individuals may be removed from the medical surveillance program if any of the following situations occur:

l. The individual is on a medical surveillance program at the recommendation of the industrial hygienist, based on presumed exposures, (where IH data is insufficient or not available), and the individual no longer works in that position for more than 30 days per year or 10 days per quarter; or

2. IH personal sample data clearly show that individuals are not exposed above the action level; or

3. Personal sample data clearly show that individuals are not exposed to a hazard or stressor above the action level for more than 30 days per year or 10 days per quarter; or

4. IH survey data document the absence of a hazard or stressor in a job or process. Personnel can also be removed based on the professional opinion of the industrial hygienist that no hazard exists.

Decision Makers in the Placement and Removal of Individuals from Medical Surveillance Programs

The decision to place or remove a individual into or from a medical surveillance program is the responsibility of the Medical Department working with IH and line safety officers and supervisors. Individuals or jobs may be included in surveillance programs until IH determinations can provide objective evidence for a final decision.

Types of Medical Surveillance and Job Certification Examinations

Most medical evaluation programs include a preplacement, a periodic and a termination examination. When there is evidence or suspicion of overexposure, a situational examination may be required.

Preplacement (baseline) examination. This provides information necessary to determine the individual's suitability for the job and is done before the individual starts work. It provides a baseline against which changes may be compared.

Periodic examination. This is performed during the time that the individual works in the job. The frequency and extent of periodic examinations depend on the program. Job certification evaluations are done periodically to make sure the

individual meets the certification requirements. For some programs, the frequency of examinations will depend on variables, such as the findings from previous examinations, the history of exposure and/or the age of the individual. When deployed personnel do not receive periodic examinations on schedule, the circumstances should be documented in the health record and the examination performed as soon as possible.

Termination examination. When the individual terminates employment or is removed from a job with a potential for hazardous exposure sufficient for medical surveillance, he/she is removed from the medical surveillance program and undergoes a termination examination. (The Asbestos Medical Surveillance Program has unique provisions for individuals removed from exposure - please see Appendix D). In some cases, the termination examination is not required if a periodic examination has been documented within the past 12 months. Documentation of the individual's state of health at the termination of exposure or employment is essential for comparison purposes if that individual later develops medical problems that could be attributed to past occupational exposures.

Situational examination. This is conducted in response to a specific incident for which a possible hazardous overexposure is suspected. Such an incident should prompt situational examinations on all individuals with suspected overexposures. Elements of the evaluation may vary considerably from routine surveillance protocols.

<u>Medical Matrix</u>

The Navy Environmental Health Center Technical Manual, Medical Surveillance Procedures Manual and Medical Matrix series is to be used as the minimum requirements for medical surveillance and job certification examination, per OPNAVINST 5100.23 series and OPNAVINST 5100.19 series.

A committee of physicians and nurses meet periodically to review and revise the programs in the matrix. The document is continuously reviewed in light of current requirements and guidance, with interim changes issued when there are major program changes. The manual is reviewed in its entirety every two years. Because instructions and guidance change more quickly than this document can be published, it is important that activities maintain current references. OSHA and Bureau of Medicine and Surgery (BUMED) regulations issued after the Medical Matrix is published take precedence over the matrix program elements.

The Medical Matrix is a primary source of guidance for medical surveillance programs. Requirements for situational examinations are not included in this document. The programs contained in the Medical Matrix are divided into four categories:

1. Chemical stressors. Placement of individuals on medical surveillance programs in this section is determined by the IH survey and is exposure driven. The examination elements of the programs are designed for hazard based medical surveillance.

2. Physical stressors such as heat, cold and noise.

3. Mixed exposures such as metal fumes and mixed solvents which may be useful when IH sampling data are not available.

4. Certification/qualification/special examinations. Examples are food service personnel, respirator user certification and firefighter examinations. These

programs provide basic guidance on required examinations, and define content of examinations when there may be no specific written guidelines. Some activities may have additional local requirements for examinations or additional occupations which are not included in the Medical Matrix. Those requirements are handled on a local basis.

A program description is included in every program and contains references used to write the program, current review or revision date, and explanations about unusual frequency or age requirements. Many programs have specific provider comments that detail unusual program components or requirements. Users should consult those areas for additional information.

Comments and requests for revisions and new programs can be sent to the Navy Environmental Health Center, ATTN: Occupational Medicine Directorate.

PC Matrix

The PC Matrix is a computer program designed to generate examinations on a SF-600, Chronological Record of Medical Care (Facsimile). The PC Matrix is based on the current edition of the Medical Matrix and contains all the programs in the Medical Matrix. The PC Matrix can combine up to nine programs without duplicating tests, and print them out on a SF 600 facsimile. Programs that require use of specific forms such as the SF-78, Certificate of Medical Examination and SF-93, Report of Medical History are not included in the PC Matrix.

Requests for the PC Matrix software, as well as comments and requests for revisions, should be sent to the Navy Environmental Health Center, ATTN: Occupational Medicine Directorate.

Medical Surveillance Examinations Using the "SOAP" Format

Documenting the medical surveillance evaluation can be effectively accomplished using the SOAP (subjective, objective, assessment, plan) format.

The history and review of systems are "subjective". The laboratory tests, ancillary tests, and the physical examination are the "objective" element. In addition to deciding what information to collect and actually collecting it, a complete surveillance program needs an "assessment" and a "plan".

The assessment is an interpretation of the results of the surveillance examination. The provider should ask "What does this mean?" or "what should be done?" for each outcome of each surveillance program element. Interpreting surveillance data is done from two viewpoints: The INDIVIDUAL worker and the GROUP. The assessment should state whether the provider believes abnormalities are related to the occupational stressor. Sometimes this question cannot be answered with certainty at the time of the initial examination. Information should be evaluated to identify evidence of occupational disease in a group of workers in the same surveillance program or working in the same process; this subject is discussed in more detail in chapter 4 of this manual.

The plan should include a mechanism to ensure that the worker receives the results and/or the assessment of the results. The plan should also address follow-up of abnormal results, and the schedule for the next re-evaluation or surveillance examination. Finally, the decision whether or not to recommend continued exposure to a stressor needs to be indicated in the plan.

Regulations Concerning Civilian Personnel

The remainder of the discussion in this chapter is concerned with medical issues related to civilian personnel. In accordance with 5 CFR 339.204, employees need possess only the minimum physical abilities necessary to perform their duties safely and efficiently. A command may not deny employment to a candidate who has a medical condition solely on the basis that at some future time, the employee's condition may become aggravated and he/she may file a claim for workers' compensation. So long as the candidate is presently able to do the job, he/she is qualified, unless the possibility that the condition might recur would present a substantial safety and/or health risk.

Medical Examination Procedures

When a command orders or offers a medical examination, it has the authority to designate the examining physician or other practitioner; additionally, the command must provide the employee an opportunity to submit medical documentation from his/her physician or practitioner. Such documentation must be reviewed and considered by the command. 5 CFR 339.104 provides a detailed discussion of the meaning of "medical documentation". "Practitioner" is defined in 5 CFR 339.104 as a person providing health services who is not a medical doctor, but is certified by a national organization and licensed by a state to provide the service in question. If additional medical information is requested as a condition of satisfactory completion of the examination, this constitutes an offer. The Navy pays the cost if the examinations are done by the provider designated by the Navy.

On Form SF-78, Certificate of Medical Examination, the applicant indicates if he/she has any medical problems which may interfere with the duties of his/her position. The physician must obtain a full explanation of the medical problems, including treatment. The working conditions generally found at the applicant's job location are listed in Form SF-78. These environmental factors, as well as the functional requirements of the position, should be considered by the examiner in light of the applicant's general health condition.

If the applicant is under a physician's care for a medical problem, and there are inconsistencies between the conclusions of the examiner and the treating physician, the examiner should try to account for such inconsistencies, and discuss their implications for the person's ability to perform the duties of the position.

The OH provider must discuss with the applicant or employee any abnormal findings detected during examination:

Pre-existing medical conditions. Although OH providers are not responsible for evaluation of pre-existing medical conditions, it is their professional duty to inform their patients of any significant findings and give proper recommendations for follow-up. The individual must be provided with copies of the abnormal findings and a note to his/her physician summarizing any abnormal findings, if indicated.

Suspected occupational illness. Laboratory tests not required by NEHC6260 TM96-1 should be ordered only if they may indicate abnormalities resulting from occupational exposure. When laboratory tests which may be affected by workplace exposure are abnormal, evaluation to follow up those tests are done by the OH provider, or by referral to the appropriate sources. If the individual prefers follow-up evaluation from his/her private physician, the employee must either pay for the evaluation, or must contact the Human Resources Office, complete Federal

Employees Compensation Act (FECA) documents and wait until approval has been obtained from the Department of Labor (DOL). If the FECA documents are completed after the employee has gone to a private physician, DOL may or may not approve payment for the medical expenses.

Making Employment Decisions

The role of the physician with respect to employment decisions is limited to determining whether the individual meets the medical requirements of the position, and the stability of the individual's medical condition. Based on the medical findings, the physician makes recommendations which may affect employment by indicating on Form SF-78 what restrictions, if any, are appropriate. Employment decisions are the responsibility of the supervisor or manager who uses available medical information as one component influencing his/her decision.

Medical information must be adequate to enable the employee's command to make an informed decision. This means that:

1. The diagnosis should be justified in accordance with established diagnostic criteria.

2. The conclusions and recommendations should be consistent with generally accepted professional standards.

3. The report should be signed by the examining physician or other appropriate practitioner.

Specific Job Qualification Medical Examinations

Routine medical examinations are not authorized for positions not covered by specific medical standards, physical requirements or medical evaluation programs. Since the duties of those positions are typically sedentary or only moderately active, candidates need only meet the general medical qualification standard in Office of Personnel Management (OPM) Qualifications Standards Handbook for General Schedule Positions and Handbook X-118C, which provide that "applicants must be physically and mentally able to efficiently perform the essential functions of the position, with or without reasonable accommodation, without hazard to themselves or others." Candidate self-certification using SF-177, Statement of Physical Ability for Light Duty Work, is considered sufficient to establish medical qualifications for those positions. The individual is presumed to be medically qualified in the absence of evidence to the contrary.

Circumstances in Which the Command May Require Medical Examinations

When the command orders or offers a medical examination to civilian personnel, it must inform the applicant or employee in writing of its reasons for doing so and the consequences of failure to cooperate. When the command is authorized to require an examination, failure to submit to the examination may be grounds for disqualifying an applicant, or taking appropriate or adverse action against an employee. However, it may not impose a penalty for refusing an offer of an examination. The command may require medical examinations in the following situations:

1. Positions covered by specific medical standards, physical requirements, or medical evaluation programs: Since successful performance in these positions is dependent upon the worker's physical or medical status, an employee may be required to undergo a medical examination:

a. Prior to appointment or selection (including reemployment on the basis of full or partial recovery from a medical condition).

b. On a regularly recurring, periodic basis after appointment.

c. Whenever there is a direct question about an employee's continued capacity to meet the physical or medical requirements of a position.

2. On-the-job injury: An employee who has applied for, or is receiving continuation of pay or compensation as a result of an on-the-job injury or disease, may be required to report for an examination to determine medical limitations that may affect placement decisions.

3. Release from competitive level: An examination may be required when an employee is released from his/her competitive level in a reduction in force, and the position to which the employee has assignment rights has medical standards or physical requirements different from those required in his/her present position.

4. Psychiatric examinations and psychological assessments may only be used to make legitimate inquiry into a person's mental fitness to successfully perform the duties of his/her position without undue hazard to the individual or others. They may be ordered <u>only</u> in either of the following situations:

a. The results of a current general medical examination, which the command has the authority to order, indicate no physical explanation for behavior which may affect the safe and efficient performance of the individual or others.

b. A psychiatric examination is specifically called for in the medical standards or medical evaluation program pertaining to the position.

<u>Circumstances in Which the Command May Offer Medical Examinations</u>

A medical examination may be offered in any situation where additional medical information is needed to make a management decision concerning civilian personnel. This may include situations where the individual requests, for medical reasons, a change in working conditions or any other benefits or special treatment (including reasonable accommodation on the basis of full or partial recovery from a medical condition), or where the individual has a performance, conduct or attendance problem which may require action by the command.

<u>Regulations Related to Handicapped Persons</u>

29 CFR 1614.203(e) provides guidelines on pre-employment inquiries regarding handicapped persons. With certain exceptions, a command may not conduct a preemployment medical examination and may not make preemployment inquiry of an applicant as to whether he/she is handicapped, or the nature and severity of a handicap. However, a command may make preemployment inquiry into an applicant's ability to meet the medical qualification requirements with or without reasonable accommodations, i.e., the minimum abilities necessary for the safe and efficient performance of the duties of the position in question. A command may condition an offer of employment on the results of a medical examination, provided that all applicants are subjected to such an examination. Other provisions are detailed in 29 CFR 1614.203.

The Equal Employment Opportunity Commission requires agencies to make reasonable accommodation to the known physical or mental limitations of qualified handicapped applicants or employees, unless the command can demonstrate that the

accommodation would impose undue hardship on the operation of its programs. An employee seeking reasonable accommodation must submit to a medical examination requested by the employer, or produce medical documentation to support a request for medical accommodation if the limitation is not immediately apparent. "Reasonable accommodation" includes making facilities accessible to and usable by handicapped persons, including job restructuring, appropriate adjustment or modification of examinations, and other similar actions.

Physical Requirements

The Office of Personnel Management (OPM) Qualifications Standards Handbook for General Schedule Positions and Handbook X-118C detail the physical requirements for each qualification standard in federal civil service. The OH provider should have a listing of the specific physical requirements for each applicant. Generally, these requirements are listed as "Functional Requirements" on Standard Form (SF)-78 (Certificate of Medical Examination). They must be met in order for an applicant to perform the job to which he/she is applying.

The examiner is responsible for evaluating the applicant to determine whether he/she meets each of these criteria. Failure to meet a properly established medical standard or physical requirement means that the individual is not qualified for the position unless a waiver or reasonable accommodation is indicated.

CHAPTER 6

TREATMENT OF ILLNESSES AND INJURIES IN THE OCCUPATIONAL HEALTH CLINIC

References

American Medical Association. *Guides to the Evaluation of Permanent Impairment.* 4th ed. Chicago, IL: American Medical Association; 1993.

ASD(HA) memo dated 25 May 1995. *TRICARE Health Services Plan-Federal Civilian Employees.*

BUMED ltr 12000 Ser 3B421/0143 of 21 Jun 91. *Occupational Health Participation in Federal Employee Compensation Act (FECA) Cost Containment.*

BUMED ltr 6260 Ser 24B/5U240237 of 20 Dec 95. *TRICARE Health Services Plan-Federal Civilian Employees.*

5 Code of Federal Regulations (CFR) Part 339. *Medical Qualification Determinations*.

20 CFR Part 10. *Federal Employees' Compensation Act.*

Injury Compensation for Federal Employees: a handbook for employing agency personnel. U.S. Department of Labor Publication CA-810; Rev. Feb. 1994.

NAVMEDCOMINST 6320.3B. *Medical and Dental Care for Eligible Persons at Navy Medical Department Facilities*.

NAVMED P-117. *Manual of the Medical Department*, Chapter 22, Preventive Medicine and Occupational Health.

OPNAVINST 5100.23 series. *Navy Occupational Safety and Health Program Manual*.

OPNAVINST 12810.1. *Federal Employees' Compensation Act (FECA) Program.*

Questions and Answers About the Federal Employees' Compensation Act, U.S. Department of Labor Pamphlet CA-550 Rev. Sept. 1988.

Smith GM. The Role of the Occupational Medicine Physician in the Management of Industrial Injury. In: Mayer TG. *Contemporary Conservative Care for Painful Spinal Disorders.* Lea & Febiger;1991:191-201.

Appendices

The following are found in Appendix G:

Definition of Terms

Sample Protocol for Injured Workers

Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation (Form CA-1)

Notice of Occupational Disease and Claim for Compensation (Form CA-2)

Employer's First Report of Injury or Occupational Illness (Form LS-202, [LHWCA)

Notice of Employee's Injury or Death (Form LS-201, LHWCA)

Introduction

Occupational Health (OH) professionals working in Naval medical treatment facilities (MTFs) have a longstanding, multidimensional role in the prevention, treatment, and administrative disposition of occupational injuries and illnesses which occur in uniformed and civil service employees of the Navy and Marine Corps. Both the Chief of Naval Operations and the Chief, Bureau of Medicine and Surgery, strongly support the essential role of the MTF in a coordinated, multidisciplinary team approach to workers' compensation case management at the activity level.

Per OPNAVINST 5100.23 series, OH services, including periodic medical examinations, treatment of acute and chronic occupational medical conditions, and medical review/management of workers' compensation cases are integral elements of the Navy Occupational Safety and Health (NAVOSH) Program. Per NAVMEDCOMINST 6320.3B and NAVMED P-117, MTFs are authorized to provide emergency and nonemergency care to civilian employees for work-related injuries and illnesses. These authorized services include medical treatment under Federal Employee Compensation Act (FECA); programs for appropriated fund employees (20 CFR 10 and Department of Labor pamphlet CA-550) and nonappropriated fund employees (NAVMEDCOMINST 6320.3B).

Background - MTF Support

Traditionally, Navy OH professionals have had a central role in the prevention and treatment of work-related injuries and illnesses. Primary prevention of adverse effects of employment through identification and elimination/control of workplace hazards is a cornerstone of the NAVOSH program. An aggressive, ongoing program of periodic medical surveillance examinations based on current industrial hygiene assessment of the employees' work centers is an important part of secondary prevention of occupational illness, cannot be overstated. Sections of this manual, as well as Chapter 8 of OPNAVINST 5100.23 series, provide a more definitive discussion of the operation of a Navy OH clinic including hazard-based medical surveillance examinations.

Despite our best preventive efforts, occupationally-related injuries and illnesses still occur. In these situations, OH professionals play vital roles in optimally managing work-related illness at their supported activities.

An often-overlooked role is that of providing clinical care to the injured/ill employee within the capabilities of the examining MTF. Per NAVMEDCOMINST 6320.3B, emergency and non-emergency OH services for appropriated and nonappropriated fund employees with work-related illness or injury are authorized through the OH clinic, emergency room, or other clinics, as appropriate. At many MTFs, this on-site treatment involves providing needed follow-up visits as well as acute evaluation/treatment of occupationally-related conditions. Many MTFs have successfully utilized on-site ancillary services (e.g. physical therapy departments) and referrals to military medical specialists (e.g. orthopedic surgeons, dermatologists) in the evaluation and treatment of work-related illnesses/injuries. The benefits for this "in-house" treatment have been clearly demonstrated in terms of convenient access to medical care for civil service employees, reduced medical costs to the Navy, and more rapid return-to-work for injured/ill employees. In addition, per the Assistant Secretary of

Defense (Health Affairs) memorandum of 25 May 1995 and Bureau of Medicine and Surgery letter of 20 Dec 1995, medical services beyond basic OH care may be reimbursable.

Besides providing direct clinical care, the occupational medicine physician can be called upon to use his/her clinical skills in the medical evaluation of employees with occupationally related illness. Specifically, the physician may serve as a medical examiner, generally for employees on long-term compensation.

OH physicians and nurses play a vital role in the oversight and review of work-related injuries and illnesses. They can support their serviced activities in a variety of ways:

1. Ongoing review of work-related injuries/illnesses for trends suggesting a particular work activity or workcenter requires further evaluation.

2. Providing periodic, first-hand evaluation of at-risk employees' work centers through site visits.

3. Serving as medical liaison with private health care providers in the case management of acute and chronic occupationally-related illnesses and injuries.

4. Providing review of medical documentation submitted to support an employee's request for workers' compensation.

5. Interfacing with occupational safety specialists, injury compensation program administrators (ICPAs) and other Human Resources Office employees, and workcenter supervisors in the activity's review and management of workers' compensation cases.

Summary of Federal Workers' Compensation Programs

Federal employees are covered by a centrally administered, essentially "no-fault" insurance (i.e. workers' compensation) system designed to address occupationally-related medical conditions.

Appropriated fund employees are covered by the Federal Employees' Compensation Act (FECA). FECA provides compensation benefits for disability due to personal injury (including occupational disease) sustained while in the performance of duty. Nonappropriated fund employees (i.e. certain employees of Navy exchanges, child care centers, and food service units) are authorized workers' compensation benefits by the Nonappropriated Fund Instrumentalities Act (section 8171 of Title 33 of the U.S. Code) under chapter 18 of the Longshoremen's and Harbor Workers' Act (LHWCA).

The administrative aspects of FECA and LHWCA differ in terms of program administration, nature of Office of Workers' Compensation (OWCP) oversight, and specific type of financial underwriting. Both programs provide similar benefits, e.g. provisions for the payment of medical expenses, recovery of lost wages, and schedule awards (lump sum payments) for permanent impairment related to occupational diseases and illnesses. FECA and LHWCA operate under a claimant (employee) burden of proof to establish both the presence of a medical condition (as defined by generally accepted medical principles and practices) and a causal relationship between that condition and the claimant's performance of duties. In other words, the claimant must present evidence establishing the medical condition was caused, aggravated, accelerated or precipitated by his/her work duties. Per Department of Labor Publication CA-810, this factor is based entirely on medical evidence provided by physicians who have examined and treated the employee. The

opinions of the employee, supervisor or witness are not considered, nor is general information contained in published articles. Appendices I-1 through I-5 provide definitions of relevant FECA and LHWCA terms as well as a sampling of the standard reporting forms used in these programs. In both programs, the OWCP is the final authority in terms of acceptance of claims, review of medical documentation, and determinations of employees' ability to return to work in either a full- or transitional (light)-duty capacity.

Both FECA and LHWCA give the injured/ill employee the responsibility and privilege of choosing his/her treating physician. A Naval activity may establish administrative procedures requiring all employees with nonemergency medical conditions to report these conditions through the activity's MTF, but employees are not required to be examined or accept treatment by the MTF's health care providers. However, even within the latter constraints, Naval activities and MTFs can have a tremendous impact on the optimal management of occupational illnesses and injuries which occur at their commands.

Medical Care for Work-related Conditions in the Navy MTF

NAVMEDCOMINST 6320.3B authorizes the following medical care for new and recurrent work-related conditions through the MTF:

1. Comprehensive care for active duty personnel

2. Comprehensive care, within the limits of MTF capability and military referral networks, for civil service and nonappropriated fund personnel

3. Emergency care for contract/civilian humanitarian injuries.

Civil service and nonappropriated fund employees have the right to choose to receive care through civilian health care providers. In order to attract successfully these employees' FECA/LHWCA "business", MTFs should strive to provide accessible, timely care of the highest caliber. For those patients who require adjunct treatment (e.g. physical therapy) or specialist evaluation beyond the capabilities of the MTF or its referral network, local civilian health care professionals can be utilized under FECA/LHWCA, with the Navy OM physician remaining as the employee's primary physician. Referral of these latter cases should be handled administratively in conjunction with the activity's ICPA.

When an employee elects to be treated at the MTF, clinic personnel should supply appropriate medical documentation in support of the employee's worker compensation claim. Such documentation can include copies of medical treatment records (SF 600 entries or 558s), physician annotation on the Request for Examination and/or Treatment forms (LHWCA Form LS-1), Duty Status Report (FECA Form CA-17), Authorization for Examination and/or Treatment (FECA Form CA-16), or Attending Physician's Report (FECA Form CA-20), or narrative report signed by the physician. Procedures should be developed locally in conjunction with the ICPA to establish the specific reports to be filed and the routing of the medical information.

Many Navy and Marine Corps activities have established procedures whereby all employees with nonemergent injuries must report to the activity MTF for administrative purposes. These may include completion of a locally developed mishap (safety) report, even for those individuals who elect to receive their care from a nonmilitary source. In these situations, procedures should be established locally (i.e. through a local FECA instruction) for the appropriate and timely medical evaluation of acutely injured employees, as well as the timely routing of required administrative reports. A sample protocol for MTF evaluation of an

injured employee is provided as Appendix I-6.

Participation in Workers' Compensation Case Management

Per OPNAVINST 12810.1, all Naval activities with an annual FECA bill of one million dollars or more are required to establish an Injury Compensation Cost Reduction Committee. This is made up of the commanding officer, civilian personnel director, ICPA, OSH manager, OM physician (if available), OH nurse and other appropriate managers tasked with oversight of the activity's efforts in reducing compensation costs and establishing effective transitional duty and return-to-work programs. The physician and/or nurse serve as essential members of the committee, providing analysis of trends in reported injuries and illnesses, results of worksite evaluations conducted in response to employee medical conditions and complaints, and the review of medical documentation submitted in support of employee FECA claims.

In addition, many OM physicians, utilizing criteria in 5 CFR 339 and appropriate professional guidance, provide written workers' compensation case reviews to the ICPA or other appropriate human resource office personnel, or serve as a liaison between the activity and the employee's treating physician as part of individual case management. OWCP has final authority over the disposition of employees with accepted claims for both FECA and LHWCA. However, physicians' medical input has been successfully submitted to OWCP as part of ongoing active participation in case management by Naval activities.

Independent Medical Evaluation of Injured/Ill Employees

Both FECA and LHWCA contain provisions allowing OWCP to require an injured/ill employee to submit to examination by a U.S. medical officer as frequently and at such times and places as in the opinion of the OWCP may be reasonably necessary. Moreover, OPNAVINST 12810.1 permits agencies to require an employee, who has applied for or is receiving continuation of pay or compensation as a result of an on-the-job injury or disease, to report for an examination to determine medical limitations that may affect placement decisions.
Accordingly, an OM physician can be called upon to perform a medical evaluation of an employee whose absence or work restrictions, as recommended by his/her personal physician, seem significantly inappropriate when compared to the reported medical condition or when a permanent job change is under consideration by the activity. Physicians performing such evaluations are strongly encouraged to review **thoroughly 5 CFR 339 and appropriate publications such as *The Role of the Occupational Medicine Physician in the Management of Industrial Injury* by G. M. Smith, and the pertinent sections of *AMA Guides to the Evaluation of Permanent Impairment*.**

Use of Navy Occupational Medicine Specialists

Residency-trained, board-certified occupational medicine specialists are available on a consultative basis at many larger MTFs and headquarters functions, including NAVENVIRHLTHCEN, to assist personnel with the treatment and administrative disposition of work-related medical conditions. Because of their extensive training in toxicology, industrial hygiene, and occupational diseases, these physicians can serve as an invaluable resource in the clinical evaluation of complex medical conditions thought to be work-related, as well as in the administrative review of unusual or suspect employee claims for occupational disease or injury.

The Role of the OH Physician

To summarize, the physician assigned to the OH Clinic provides support to the activity's NAVOSH program in a variety of ways, including but not limited to:

1. Actively supporting occupationally related injury/illness prevention through comprehensive workplace evaluation and medical surveillance programs.

2. Providing medical care within MTF capabilities to active duty and civil service personnel for work-related medical conditions.

3. Remaining abreast of changing federal regulations, clinical practice guidelines and emerging ethical issues relevant to occupational medicine.

4. Serving as part of a multidisciplinary team in the ongoing review of workers' compensation cases.

5. Providing case reviews, utilizing occupational medicine specialist consultation when appropriate.

6. Providing liaison with local civilian health care providers in workers' compensation case management.

7. Providing medical examinations.

The Role of the OH Nurse

The role of the nurse in providing support for injured employees may encompass the following:

1. Providing early intervention.

2. Providing immediate initial assessment/documentation, nursing diagnosis, and implementation of treatment plans.

3. Initiating follow-up of medical care, if the employee elects a private provider, including advising employee and provider of light duty availability; or facilitating care by Navy provider if the employee so chooses.

4. Documenting treatment, pre-existing conditions, medical and occupational history.

5. Facilitating team communication by coordinating worksite visits with supervisors, safety professionals, industrial hygienists and ICPAs to evaluate ergonomic factors and identify safe light duty assignments.

6. Making personal contact with the employee to monitor injury status, provide information about medical treatment, and assist in any problems which may inhibit recovery and return to work.

7. Communicating verbally and in writing with the private provider, as needed, concerning the treatment plan, prognosis and work status. Assisting in obtaining approvals for surgery and special procedures from OWCP.

8. Making home visits, when needed, to assess the injured employee's status, reviewing treatment plans and helping expedite the employee's return to work.

9. Consulting with claims examiners and technical advisors at OWCP.

10. Serving as the communication liaison between the employee, the attending

physician and OWCP.

11. Coordinating with all commands in managing employees returning to work on transitional duty status, and assisting in preparing transitional duty job offers.

12. Tracking progress on recovery after the employee returns to work, by making contact with the employee, private provider and supervisor.

13. Assuring that medical treatment and medication charged were actually provided and were appropriate for the condition approved by OWCP.

14. Educating providers and administrators regarding civilian eligibility for treatment and the cost saving benefit if care is provided by Navy facilities.

15. Assisting with referral as needed.

Long Term Case Management involves employees who have been on the workers' compensation rolls for an extended period of time. Although the above areas may apply, additionally the OH nurse:

1. Provides assistance in updating medical information for permanent medical placement and reevaluation of employees in long term transitional duty status.
2. Works with OWCP to manage long term compensation with the goal of returning employees to work.

3. Coordinates with DOL/OWCP locally contracted rehabilitation nurses, nurse case managers and physicians.

4. Follows transitional duty cases until they return to regular duty or are referred for medical placement.

CHAPTER 7

GENERAL AND MEDICAL RECORDS

References

5 Code of Federal Regulations (CFR) 293 Subpart E. *Employee Medical File System Records.*

29 CFR 1910.20. *Access to Employee Exposure and Medical Records.*

DODINST 6055.5. *Industrial Hygiene and Occupational Health*. 10 Jan 89.

NAVMED P-117. *Manual of the Medical Department*, Chapter 16, Medical Records.

OPNAVINST 5100.23 series. *Navy Occupational Safety and Health Program Manual.*

SECNAVINST 5212.5C. *Navy and Marine Corps Records Disposition Manual.* 11 July 85

SECNAVINST 5212.10A. *Mandatory Retention of Insulation/Asbestos Related. Records.* 15 Sep 86.

Introduction

In this chapter, the term "medical records" refers to health records/ employee medical files and x-rays generated as part of occupational medicine evaluations.

Medical records and their contents are the property of the federal government. Active duty and civilian medical records are the responsibility of the Bureau of Medicine and Surgery.

SECNAVINST 5212.5C, SECNAVINST 5212.10A and DODINST 6055.5 implement Occupational Safety and Health Administration(OSHA) and Office of Personnel Management (OPM) requirements in the Navy community for the handling, maintenance, transfer and retirement of medical records.

Definitions

NAVMED P-117. The Manual of the Medical Department, NAVMED P-117, lists the following definitions:

1. Medical Record - an account compiled by physicians and other health care professionals of a patient's medical history, present illness, findings on examination, details of treatment, and progress notes.

2. Primary Records - the original records established to document the continuation of care given to a beneficiary. A health record, which is a type of primary record, is a file of continuous care given to an active duty member. The health records of federal civil service employees are known as employee medical files.

3. Secondary Records are medical records which are maintained separate from the primary record; these include convenience, temporary and ancillary records. Occupational medical records do not include secondary records.

OSHA. DODINST 6055.5 requires compliance with the Occupational Safety and

Health Act. Per 29 CFR 1910.20, the employee medical record means a record concerning the health status of an employee which is made or maintained by a physician, nurse, or other health care personnel, including: (1) medical and employment questionnaires (including job descriptions and occupational exposures (2) the results of medical examination (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for the purposes of establishing a baseline or detecting occupational illness.

Civilian Medical Records

Civilian employee medical records are the responsibility of the Navy. They are subject to Navy regulations and also must meet OPM regulations (5 CFR 293, Subpart E).

Civilian occupational medical record requirements are covered in the OPM Employee Medical File System (EMFS). Individual medical records are referred to as the Employee Medical Folder. Medical records are maintained in accordance with Privacy Act regulations.

5 CFR 293 provides the following requirements for civilian medical records:

1. Agencies must provide employees access to their own EMFS records consistent with Office regulations contained in 297.204(c) of that chapter. Disclosure of an employee's occupational medical records to agency officials (both medical and non-medical) will be granted only when the specific information sought is needed for the performance of official duties.

2. Ensure that, if occupational medical records are to be physically located in the same office as the Official Personnel Folder (OPF), the records are maintained physically apart from each other.

3. Set forth a policy that distinguishes, particularly for purposes of records disclosure, records in the nature of physician treatment records (which are generally not appropriate for disclosure to non-medical officials) from other medical reports properly available to officials making management decisions concerning the employee.

Retention of Medical Records

Part III, Chapter 6 (Medicine and Dentistry Records) of SECNAVINST 5212.5C contain the regulations for records which relate to the administration of performance of health and dental functions by the Navy Medical Department. They include records of examination, care and treatment of individuals, physical fitness, environmental, and health care program records accumulated in connection with carrying out medical department functions.

29 CFR 1910.20 requires that employee medical records be maintained for at least the duration of employment plus thirty (30) years except for some types of records. Those exceptions include health insurance claims records, first aid records and records of employees who have worked for less than one year.

SECNAVINST 5212.10A requires the Navy to hold asbestos related documents indefinitely. Additionally, 29 CFR 1910.20 specifies "chest X-ray films shall be preserved in their original state"; this includes PA chest x-rays taken as part of the asbestos medical surveillance program (which are OSHA mandated).

Access to Medical Records

Medical records and their contents must be retained by the medical department and be accessible to the medical staff without compromising the security of the records.

Access to medical records must follow Privacy Act protocols, and include making the records available to the employee or the employee's representative when that representative has the employee's written permission. If the physician believes direct access by the employee to information in the medical record may be detrimental to the employee's health, the employer may deny direct access for that information only while providing access to the employee's designated representative. A copy of the medical record must be provided to the employee upon the employee's request. When additional copies of information previously provided are requested, a charge may be applied for the copies. Refer to NAVMED P-117, 5 CFR 293, 29 CFR 1910.20 and OPNAVINST 5100.23 series for specific Privacy Act issues.

Disclosure of an employee's medical records to agency officials is limited to the specific information necessary for the performance of official duties. (See 5 CFR 293).

Maintenance of Medical Records

NAVMED P-117 describes some of the routine forms in the medical records and the order in which forms are to be filed. 29 CFR 1910.20 provides guidance on all OH records. While in Navy custody, medical records are maintained under the guidance of NAVMED P-117. OPNAVINST 5100.23 series describes information to be maintained in military and civilian employee medical records in compliance with OSHA.

Civilian employees who are retired military members or military dependents must have medical records established just as other civilian employees. The military records of those individuals must be treated as a separate system of records. Both the civilian employee record and the military record must reference each other. The general beneficiary medical record must be kept separate from the official civilian employee medical record.

Transfer of Medical Records

Military medical records. Transfer these records in accordance with NAVMED P-117. For a routine transfer to another Navy command, the military medical record transfers with the service member. X-rays of military personnel remain at the location where the x-ray was taken.

Civilian Medical Records. Transfer these records in accordance with NAVMED P-117. Transfer may be facilitated if the receiving personnel office notifies the employee's previous MTF of the need to transfer the medical records. Human Resources Offices should notify MTFs when personnel leave employment, and should request records of new employees from the previous MTF. In many locations, this may not work smoothly without assistance of the MTF. MTFs may need to expedite the record transfer.

Civilian employee medical records must additionally comply with OPM regulations. When a civilian employee makes an inter- or intra-agency transfer within the federal government, the medical record (including x-rays) transfers to the receiving MTF. When the employee transfers outside the Navy community to another federal job, 29 CFR 1910.20 must be followed, including placing the medical record data in the SF 66D folder.

Asbestos x-rays. Because SECNAVINST 5212.10 prohibits the destruction of asbestos related documents, asbestos chest x-rays are not to be transferred outside the Navy community. Civilian asbestos X-rays should be retained by the last MTF holding the x-rays and a note placed in the medical record identifying the location of the x-rays. Each clinic holding x-rays must maintain the x-rays with mechanisms for retrieval as needed. On-site review of these x-rays is described in 29 CFR 1910.20 - "In the case of an original x-ray, the employer may restrict access to on-site examination or make other suitable arrangement for the temporary loan of the X-ray."

Storage of Records

When storing records, whether general or medical, the detailed procedures contained in SECNAVINST 5212.5C, Appendix C must be followed. No Navy command or activity is exempt. If correct transfer procedures are not followed or proper record transfer documents are not provided, the entire records shipment can be returned to the transferring command or the immediate superior in command for correction.

Medical Records. When the individual retires, transfers outside Navy community or leaves Navy employment, the medical record is stored in compliance with SECNAVINST 5212.10A, NAVMED P-117, 5 CFR 293 and 29 CFR 1910.20. Military and civilian employee records are kept at separate locations and must be handled separately.

Military	Civilian
Department of Veterans Affairs Service Medical Records Center P.O. Box 150950 St. Louis, MO 63115-8950	Civilian Personnel Records 111 Winnebago Street St Louis, MO 63118 (312) 425-5760

The Navy medical records forwarded to St. Louis remain accessible to the Navy and can be returned to the Navy upon request. Additionally, individuals can request copies of their records directly from St. Louis.

Civilian medical records. FRC SF 66C ("blue folder") is the required folder for retiring medical records when the civilian has worked for one agency only. If the employee has worked outside the DOD agency, SF 66D ("orange folder") is required. The order of the medical record must be in compliance with 5 CFR 293.

X-rays. Currently, neither St. Louis facility accepts radiographs larger than 8.5" X 11" (these do not fit in the medical records). Since OSHA requires chest x-rays (which are larger than 8.5" X 11") to be retained in their original state, chest x-rays of military personnel remain in the MTF that took the x-ray, while chest x-rays of civilian personnel remain in the last MTF that provided occupational health services.

Asbestos related documents. When medical records containing asbestos related information are retired to St. Louis, (1) they must be packed separately and labeled ASBESTOS RELATED DOCUMENTS; (2) in accordance with SECNAVINST 5212.10A: "submit the original and two copies of SF 135 to the FRC, identifying all asbestos records by filling in item 6f, "Series Description" on the SF 135 with the statement, "ASBESTOS RELATED DOCUMENTS."

Records other than Personal Medical Records. SECNAVINST 5212.5C, Appendix

C-9, contains a list and areas of responsibility for regional FRCs where records other than personnel medical records are to be forwarded. Commands are encouraged to contact the appropriate FRC for information and specific guidance to facilitate smooth record transfers.

Follow normal records retirement procedures by submitting a properly completed SF 135, Records Transmittal and Receipt, to the appropriate Federal Record Centers (FRC). Records must be properly identified, packed in the required boxes and accompanied by the SF 135. State the length of time the files must be maintained and identify the command authorized to release the material for destruction. If the length of time is not specified, the FRC cannot accept the records.

Closing Facilities

General. When a medical treatment facility (MTF) or supported line command is scheduled to close, SECNAVINST 5212.5C should be reviewed carefully, following the directions for archiving records. All commands are encouraged to contact their regional FRCs, participate in their training programs and invite FRC personnel to visit. Key personnel should be identified and trained in preparation for base/facility closing to facilitate a smooth record transfer. The appropriate FRC must be contacted to request retirement of records earlier than routinely permitted by SECNAVINST 5212.5C. FRCs have been cooperative in accepting records early when notified of a command or base closing. Records forwarded to FRCs must be trackable and retrievable when queries are received.

Bases. When bases are "cleaned up" and/or turned over to other commands, agencies, or the private sector, regulations may require that survey data be available to determine the status of the facility. Because of the importance of these records, consideration must be given to maintaining industrial hygiene (IH) records with the responsible MTF until the Navy is no longer responsible and inquiries are not being received relating to the data available in IH surveys.

Line Command. When the line command closes, and the supporting MTF remains open, medical and IH environmental data which are no longer active may be retired as specified in SECNAVINST 5212.5C. Medical records and IH environmental documents of employees with workers compensation claims are considered active and must be retained by the responsible MTF.

Medical Treatment Facilities. When a MTF closes, and the supported line command remains open, data and records must be transferred to the appropriate MTF responsible for the medical support of the line command. Follow routine procedures for transferring medical records as the employee/service members are transferred, or forward them to the NPRCs in St. Louis.

Chests x-rays (14" X 17") are not accepted in the medical records for archiving. These x-rays must be transferred to the MTF responsible for the geographic area where the closing MTF is located, and must be accessible to employees or former employees in compliance with the Privacy Act. A notice must be placed in the medical record indicating where and how these x-rays can be obtained.

In special situations, x-rays are forwarded to the regional FRCs for archiving. When this is done, care must be taken to have the x-rays retained in compliance with federal regulations. A tracking system for retrieval of the x-rays is needed. Asbestos x-rays must be forwarded separately from non-asbestos-related x-rays, and labeled ASBESTOS RELATED DOCUMENTS so that the FRC staff can

retain those x-rays indefinitely in accordance with regulations.

APPENDIX A

ORGANIZATION OF THE NAVY ENVIRONMENTAL HEALTH CENTER

A. NAVY OCCUPATIONAL HEALTH CHAIN OF COMMAND

The Navy Environmental Health Center (NAVENVIRHLTHCEN) coordinates and provides centralized support and services to Navy medical activities ashore and afloat in the areas of occupational health (OH), preventive medicine, and environmental health. It is also charged with coordinating and reviewing all OH and preventive medicine programs under the direction and management of the Bureau of Medicine and Surgery. It is responsible for nine Echelon 4 commands.

The chain of command for NAVENVIRHLTHCEN is as follows:

Echelon 1 - Chief of Naval Operations
Echelon 2 - Bureau of Medicine and Surgery (BUMED)
Echelon 3 - NAVENVIRHLTHCEN
Echelon 4 - Navy Environmental and Preventive Medicine (NAVENPVNTMEDU) TWO Norfolk
NAVENPVNTMEDU FIVE San Diego
NAVENPVNTMEDU SIX Pearl Harbor
NAVENPVNTMEDU SEVEN Sigonella
Navy Disease Vector Ecology and Control Center (NAVDISVECTECOLCONCEN) Alameda
NAVDISVECTECOLCONCEN Jacksonville
Navy Drug Screening Laboratory (NAVDRUGLAB) Great Lakes
NAVDRUGLAB Jacksonville
NAVDRUGLAB San Diego

B. ASSISTANCE AVAILABLE TO OCCUPATIONAL HEALTH (OH) PERSONNEL FROM NAVENVIRHLTHCEN DIRECTORATES AND COMMITTEES

Occupational Medicine Directorate. The directorate provides technical support to higher authority on occupational medicine issues and professional guidance to field activities on all matters related to the Navy workplace.

1. The Occupational Medicine (OM) Team is composed of physicians, nurses, and other subject matter experts knowledgeable in a variety of occupational medicine matters including, but certainly not limited to heat stress, pediatric lead screening, occupational health nursing, reproductive hazards and asbestos. They coordinate the Navy Pediatric Lead Poisoning Prevention Program. The Medical Review Office reviews opiate positive urinalysis of all active duty personnel, and provides guidance to medical and other Navy personnel on interpretation of drug positive urinalysis.

2. The Occupational Audiology Team is composed of subject matter experts who provide consultation and guidance to audiologists, physicians, occupational health nurses, hearing conservation program managers and other health professionals. They initiate and review policy recommendations, both from the field and to higher authority, regarding medical aspects of occupational audiology.

3. The Radiation Health Team is composed of radiation health officers and health physicists who provide consultation and guidance to radiation health officers, radiation safety officers, physicians and industrial hygienists on such matters as radioactive material safety, x-ray machine performance testing, and laser and radiofrequency radiation hazards. They also research, review and draft

Navy Radioactive Material Permits for issuance by CNO (N455) to Navy medical commands.

Preventive Medicine and Health Promotion Directorate. The directorate helps formulate preventive medicine and health promotion policy, and provides consultation and reference materials to headquarters and field activities. The staff writes instructions and technical manuals for the Bureau of Medicine and Surgery and reviews policy regulations written by other Navy commands. The Preventive Medicine and Health Promotion Directorate brings applied science to the field as quickly as possible using advanced computer technology and communications systems.

1. <u>The Preventive Medicine Team</u> assists in curbing the incidence of infectious, communicable, and vector-borne diseases aboard ships and installations, and during military operations. The team coordinates the collection and distribution of global medical information, serves as a tracking center for disease trends, and provides epidemiological, entomological and environmental health training, consultation, and on-site technical support. These resources are available to respond quickly and effectively to disease outbreaks.

2. T<u>he Health Promotion Team</u> advances our nation's Healthy People 2000 initiatives by focusing on seven militarily important core programs: Tobacco Cessation, Nutrition Education, Hypertension Screening and Education, Stress Management, Substance Abuse and Prevention, Back Injury Prevention, and Physical Fitness. The staff helps medical treatment facilities and line commands of the Navy and Marine Corps build and maintain active health promotion programs by providing start-up and advanced instructional materials, offering training classes, and conducting program evaluations on location. For medical and dental treatment facilities, additional support is available to enhance their health protection program, clinical preventive services, and their Put Prevention into Practice (PPIP) program.

Industrial Hygiene (IH) Directorate. Services provided to NEHC detachments and echelon 4 activities include the following:

1. Personnel provide information on various IH topics, and when necessary, may make a site visit to resolve the problem. Industrial Hygiene Consultative Assistance Teams (CATs) are provided to BUMED field activities which do not have the appropriate resources to solve specific problems. The Workplace Monitor Course is a two week course provided to Navy and Marine Corps personnel who perform IH sampling.

2. The Hazardous Materials team supports medical activities with technical information and consultation pertaining to health hazard assessments. It serves as a point of contact for all areas related to hazardous materials.

Environmental Programs Directorate. The directorate provides medical consultative support to the Installation Restoration Program for the clean-up of past hazardous waste sites. OH personnel may occasionally be asked to perform a medical evaluation of hazardous waste site workers. They may call for information on databases and technical information resources maintained by the directorate on the following:

1. Biological effects of hazardous materials.

2. The Environmental Protection Agency risk assessment process to evaluate. hazardous waste sites.

3. The Agency for Toxic Substances and Disease Registry public health assessment process to evaluate potential health outcomes associated with hazardous waste sites.

Naval Inspector General Oversight Inspection Unit (NOIU). NOIU conducts oversight inspections of the Navy's safety, OH and environmental programs. The NOIU mission is to evaluate activity compliance with applicable federal and state laws and statutes, and Department of Defense/Department of the Navy regulations.

1. NAVOSH Oversight Inspection Unit (NAVOSH OIU) conducts the safety and OH inspections of Naval shore activities. NAVOSH OIU evaluates the OH support provided by the servicing medical treatment facility for each activity inspected. From an occupational medicine standpoint, the primary area of concern is the medical surveillance program. Inspection protocol primarily consists of reviewing selected medical records of occupationally exposed personnel to determine if required medical surveillance is being conducted. The primary source document used by the inspection team is OPNAVINST 5100.23 series. Applicable OSHA and consensus standards are applied where no NAVOSH standard currently exists.

2. Navy Environmental Inspection Team (NEIT) conducts environmental program compliance oversight inspections. The area of concern for occupational medicine personnel revolves around health risk assessments for environmental pollutants. The primary reference used for NEIT inspections is OPNAVINST series. Applicable federal standards are located mainly in 40 CFR.

Resources Management Directorate. Services provided to NEHC detachments and echelon 4 activities include the following:

1. The directorate provides financial support services for budgeting and accounting to NEHC detachments, and has responsibility for oversight of echelon 4 activities.

2. All requests for investment equipment to support OH functions in the BUMED claimancy are submitted through this directorate for technical review, consolidation and prioritization.

3. Onsite and mail-in calibration and repair services for audiometers and sound level meters are provided for the BUMED claimancy.

4. Automated Information System (AIS) security and general information technology support services are available to echelon 4 activities.

Library. The NEHC Library, telephone (804) 363-5451, is part of the Resources and Support directorate It provides the following services to all NEHC detachments and echelon 4 personnel:

1. Books and journals: The staff mail books and photocopied journal articles to personnel upon request. Interlibrary loans can be arranged for books not available in the library.

2. Online literature searches: Library personnel can search the National Library of Medicine (NLM) automated information resources on a wide variety of topics (Information on NLM is provided in Appendix F). They can arrange a direct connection between echelon 4 activities and the NLM computer. This enables the echelon 4 staff to perform basic MEDLINE searches with a desktop PC and modem.

3. Government publications: Library personnel can research needed citations and

provide copies.

Navy OH Committees. Membership in these multidisciplinary committees is not limited to NAVENVIRHLTHCEN personnel.

1. <u>The Medical Matrix Committee.</u> This committee was formed to develop standard examination protocols for medical surveillance programs which could be presented in a user friendly format. These programs are contained in the Medical Matrix which is published as a Navy Environmental Health Center Technical Manual. OPNAVINST 5100.23 series and OPNAVINST 5100.19 series require the Medical Matrix be used as the minimum guidelines for medical surveillance and certification examinations.

The Medical Matrix is reviewed and updated very two years by the committee. OH personnel can send comments and requests for revisions and new programs to the Navy Environmental Health Center, ATTN: Occupational Medicine Directorate.

2. <u>Navy Reproductive Hazards Review Board.</u> This board is responsible for periodically updating the Navy reproductive hazards list.

APPENDIX B

NONPHYSICIAN HEALTH CARE PROVIDERS IN OCCUPATIONAL HEALTH

References

CHBUMED ltr 6300 Ser 24/0087 of 5 Jun 90. ***Nonphysician Occupational health Providers.***

20 CFR 10. ***Federal Employees' Compensation Act.***

29 Code of Federal Regulations (CFR) 1910 series.

49 CFR 391.43. ***Federal Motor Carrier Safety Regulations*****.**

NAVMEDCOMINST 6550.5A. ***Guidelines for the Use of Physician Assistants.*** **21 April 89.**

NAVMED P-117. ***Manual of the Medical Department.***

NAVMED P-5055. ***Radiation Health Protection Manual.*** **1992**

OPNAVINST 5100.19 series. ***Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*****.**

OPNAVINST 6400.1A. ***Certification, Training, and Use of Independent Duty Hospital Corpsmen (IDCs)*****. 11 Feb 93.**

Standards of Occupational Health Nursing Practice. **AAOHN, 1994.**

Introduction

The use of nonphysician health care providers in the delivery of occupational health (OH) services is affected by numerous federal and state regulations, Navy instructions, state professional licensing standards, and professional practice guidelines. In simplest terms, all medical treatment and all medical examinations are to be performed by or under the supervision of physicians. Specific OH program requirements are actually much more complicated and in many cases incompletely defined. OH clinics and other medical departments providing OH services are strongly encouraged to consult with NAVENVIRHLTHCEN when questions arise regarding the use of nonphysician health care providers.

Medical Surveillance Examinations

Navy instructions do not specifically address the use of nonphysician providers for medical surveillance examinations, i.e. those examinations in the medical surveillance section of the Medical Matrix. Occupational Safety and Health Administration standards generally only require these examinations to be performed "by or under the supervision of physicians". In general, these examinations will be performed by physicians, and credentialed nonphysician providers, i.e. physicians' assistants (PAs) or nurse practitioners (NPs). NAVMEDCOMINST 6550.5A requires that all SF-93s and SF-88s prepared by a PA must be reviewed and countersigned by a physician. BUMEDINST 6550.10 states that orders written on patient medical records by NPs do not require cosigning by physicians, but makes no statements on any requirements for signatures on medical surveillance and certification examinations. The Manual of Medicine, article 16-

15, covers situations not addressed by specific instructions. It states that local medical treatment facilities must establish policies to determine what forms, reports or orders attending physicians must sign.

The ability to use OH nurses (OHNs) and independent duty hospital corpsmen (IDCs) to perform medical surveillance and certification evaluations is less clear. The Manual of the Medical Department authorizes credentialed providers to perform physical examinations. OPNAVINST 6400.1A does not include "physical examinations" in the scope of care or performance skills for IDCs. "Medical surveillance programs" is included in the performance skills sections for IDCs, but is not defined. Some medical surveillance and certification evaluations require minimal assessment without the need for a complete physical examination. Under these circumstances and when local protocols are established and reviewed/updated periodically, OHNs and IDCs can provide the necessary assessment with referral to the physician for all abnormal findings. Prudence dictates that medical surveillance and certification evaluations be performed by OHNs and IDCs only when appropriate protocols are in place, including physician oversight.

Certification Examinations

Although greater guidance is available on the use of nonphysician providers for performance of certification examinations, there is tremendous variability depending on the specific program.

Drivers. The Federal Motor Carrier Safety Regulations require that examinations for covered drivers be performed only by physicians.

Communicable Disease Prevention. Certification evaluations primarily directed at prevention of communicable diseases, such as food handlers and child care workers, are typically performed by physician extenders, including OHNs, IDCs, preventive medicine technicians (PMTs) and other public health practitioners, with referral to physicians as necessary.

Special Duty. The Manual of the Medical Department, article 15-63 requires that all initial medical examinations for special duty (includes explosive handlers and explosive vehicle operators) must be performed by physicians, but PAs or NPs may perform special duty examinations when a medical officer or Department of Defense physician is not available or examination workload necessitates. In such cases, the examination must be countersigned (block 80 of SF-88) by a physician.

Respirator Users. OPNAVINST 5100.19 series allows afloat medical department representatives to perform initial screening and qualification of respirator users based on a medical history, with referral to a physician when positive responses are provided on the history. CHBUMED letter 6300 Ser 24/0087 of 5 Jun 90 authorized nonphysician providers, including OHNs and IDCs, to perform respirator qualifications under physician supervision. If the worker is cleared to use respirators without restrictions, a physician's signature is not required. Medical evaluation reports that restrict or do not permit respirator use should be signed by a physician, except in shipboard situations when the physician supervisor is not available. State nursing license standards, as well as the training and experience of individual OHNs, may affect their being able to perform these evaluations.

Medical Treatment

Medical treatment provided in OH clinics should be handled similarly to

other clinical departments in the medical treatment facility. The scope of injury and illness care provided by OHNs will be determined by the training and experience of the nurse, state nursing licensing standards, and facility quality improvement (QI) and credentialling/privileging instructions. In addition, the Federal Employees Compensation Act requires that injury care provided by PAs or NPs be countersigned by a physician.

APPENDIX C

TRAINING AND CERTIFICATION

References

OPNAVINST 5100.23 series. *Navy Occupational Safety and Health Program Manual*.

OPNAVINST 5100.19 series. *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*.

BUMEDINST 6320.66 A. *Credentials Review and Privileging Program.* 9 Sep 91.

NAVMEDCOMINST 1500.2. *Resuscitation Training.* 16 Dec 87.

Occupational Safety and Health Training for Employees

Training programs designed to provide employees with information on occupational health (OH) hazards and appropriate control measures are essential elements of the Navy Occupational Safety and Health (NAVOSH) Program. While training in these programs is usually the responsibility of the Safety Office, maximum effectiveness will be attained if an OH Department representative is available to explain adverse health effects associated with exposure to occupational hazards, medical surveillance procedures, and first aid measures.

OPNAVINST 5100.23 series requires training programs in all commands with employees on specific programs. Records must be maintained for five years to indicate the training provided, names of attendees and date of training. The training should also be recorded in the employee personnel folder.

Credentialing of Professional Occupational Health Personnel

Physicians, nurse practitioners, audiologists and physicians' assistants providing health care must be credentialed in accordance with OPNAVINST 6320.4A. Credentialing is the process whereby the commander of the medical or dental treatment facility, or unit with medical or dental treatment capability, upon recommendations from the credentials committee, grants to individual health care providers the privilege and responsibility of providing medical or dental care within the treatment facility. Temporary clinical privileges are granted to health care providers after verification of credentials and while current clinical competence is assessed. Defined clinical privileges are granted to health care providers after thorough review of their credentials and demonstrated competence. These are granted for a period of no more than two years. The process of renewing clinical privileges follows the same procedures used for granting initial privileges.

Certification/Licensing

Physicians and nurses are responsible for maintaining current state medical or nursing licenses. They must be provided the opportunity to attend conferences and courses in order to meet continuing medical education requirements for state licensure, and to acquire and maintain certification in their specialties.

Certification is a voluntary mechanism for validating a professional's knowledge in a specialized field. Occupational health nurses and occupational medicine physicians can demonstrate proficiency in the specialty by obtaining certification. Certification confirms that the nurse or physician has met

standards for experience, education and knowledge.

1. Occupational Health Nurses. The sole certifying agency for occupational health nurses is the American Board for Occupational Health Nurses, Inc. (ABOHN). ABOHN is a member of the American Board of Nursing Specialties. Further information is available from:

American Board for Occupational Health Nurses, Inc.
201 East Ogden
Suite 114
Hinsdale, IL 60521-3652
Telephone (708) 789-5799

2. Occupational Medicine Physicians. The sole certifying agency for occupational medicine physicians is the American Board of Preventive Medicine Inc. ABPM is a member of the American Board of Medical Specialties. Further information is available from:

American Board of Preventive Medicine Inc.
9950 West Lawrence Avenue, Suite 106
Schiller Park, IL 60176
Telephone (708) 671-1750

Training and Certification of Other Occupational Health Personnel

The U.S. Navy and the Occupational Safety and Health Administration (OSHA) require professional and paraprofessional personnel performing specific elements of the medical surveillance examinations to receive training and/or certification in those particular occupational health programs and/or in the operation of specific equipment.

1. Hearing Conservation Program. All personnel performing audiometric testing for the Hearing Conservation Program are required to attend and successfully complete a Navy approved Audiometric Certification Course and recertify every three years.

Personnel who conduct Navy sponsored courses in occupational hearing conservation (audiologists, physicians, nurses, industrial hygienists, safety professionals and others) must be certified as course directors by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) and be approved by the Navy Environmental Health Center. They must be provided the opportunity to attend conferences and courses in order to obtain or recertify their credentials every 5 years.

2. Pulmonary Function Testing. All personnel performing pulmonary function testing for medical surveillance programs are required to complete successfully a National Institute of Occupational Safety and Health (NIOSH) approved course on spirometry. A Navy-sponsored NIOSH approved course is recommended but is not required.

Personnel who conduct Navy-sponsored courses in pulmonary function testing must have the NIOSH approval to conduct such courses.

3. Sight Screening. All personnel performing sight screening examinations should be trained by qualified technicians on the elements of the Sight Conservation Program and the use of the screening equipment.

4. Basic Life Support. NAVMEDCOMINST l500.2 requires training in Basic Life Support for all Medical Department personnel assigned to, or subject to being assigned to, duties providing direct therapeutic or diagnostic health care.

Annual Training Plans

Each Occupational Health staff member is encouraged to develop an annual training plan in order to meet the minimum health training requirements required by OPNAVINST 5100.23 series. While a training plan is not a requirement, it provides an excellent method for tracking the training needs of each staff member and facilitates budget submissions. Each individual training plan should specify type, justification, cost, source and priority of training.

Training Commands

Chief of Naval Education and Training (CNET). CNET is an echelon 2 command under the Chief of Naval Operations. Its activities include the following:

1. Establishes policy and guidelines for training, projects training needs, and plans resource allocation.

2. Develops personnel qualification standards, and inservice training policies and procedures.

3. Manages the Navy's voluntary education program, and officer and enlisted career development education and training programs.

Naval Occupational Safety & Health, and Environmental Training Center (NAVOSHENVTRACEN). NAVOSHENVTRACEN, originally the Safety School, is an Echelon III command reporting directly to CNET. It provides training on occupational safety and health, hazardous materials and environmental protection. Classes are conducted worldwide for military and civilian personnel at major home ports and overseas activities.

Course descriptions and prerequisites may be found in the current CNETNOTE 5100, the Catalog of Navy Training courses (CANTRAC), and the NAVEDTRA 10500 available in CD-ROM format. A program supports professional development training for occupational safety and health professionals (military or civilian) when Navy sponsored classes cannot be provided. Under this program, NAVOSHENVTRACEN advances tuition/registration fees for selected courses which are listed in "NAVOSH Training: NAVOSH Registration Fee Advance Program", published by the command.

Resources for Continuing Education

The Navy Environmental Health Center offers or coordinates the following Navy courses:

1. NIOSH Approved Course in Spirometry

2. Navy Hearing Conservation Course

3. Workplace Monitor Course

4. Annual Navy Occupational Health and Preventive Medicine Workshop

The American Occupational Health Conference is held annually. Information can be obtained from the following:

American College of Occupational and Environmental Medicine
55 West Seegers Road
Arlington Heights, IL 60005

American Association of Occupational Health Nurses
50 Lenox Pointe
Atlanta, GA 30324-3176

"Educational Resource Centers" is a catalog published by the National Institute for Occupational Safety and Health (NIOSH) which lists courses offered by NIOSH and different universities. It is available from:

National Institute for Occupational Safety and Health
Division of Training and Manpower Development
46676 Columbia Parkway
Cincinnati, OH 45226

Audiovisual Aids

Navy Visual Information (VI) Programs. The following Navy VI libraries lend films on different subject, including safety and health-related subjects:

1. Base VI libraries - located at Naval bases. They provide over-the-counter loans to installation tenant activities only.

2. General audiovisual libraries - provide over-the-counter loans to local area fleet and shore activities and mail loans to Navy activities worldwide. They are supported by an Inventory Control Point (ICP) at Tobyhanna Army Depot, Tobyhanna, PA. For loan of Navy VI productions that are not available from a local base VI library:

a. Navy requesters east of the Mississippi River, and in the North and South Atlantic areas, Europe, Middle East, Africa, Central and South America shall forward requests to:

Dir/NETPMSA Unit-Norfolk
9770 Decatur Ave/Suite 250
Norfolk, VA 23511-1468
DSN 564-4011/1468: Commercial (804) 444-4011/468

b. Navy requesters west of the Mississippi River and in the Pacific, Far East, South Asia and the Indian Ocean areas shall forward requests to:

Dir/NETPMSA VI Unit - San Diego
921 W Broadway
San Diego, CA 92132-5105
DSN 522-1359/1360/1361; Commercial (619) 532-1359/1360/1361

APPENDIX D

CLINICAL EVALUATION

A. EVALUATION OF LIVER FUNCTION TESTS

References

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Introduction

The liver, as the primary site of metabolism of chemicals, is a potential site of damage from many chemicals used in the workplace. The most common workplace chemicals known to cause liver injury are the organic solvents. Many of the halogenated hydrocarbon solvents, the nitrogen-containing chemicals and the alcohol solvents can damage the liver. The more toxic chemicals, such as carbon tetrachloride, have been removed from the workplace because of liver damage, but may still be found in older specialized processes or in research facilities. Workplace exposures to the alcohol solvents, primarily ethyl and methyl alcohol, are infrequent causes of abnormal liver tests, but may cause abnormal findings if combined with non-workplace exposure or ingestion. Ethyl alcohol can also interact with the metabolism of numerous chemicals that affect the liver. In addition to hepatotoxic chemicals, many viral infections and some bacterial infections encountered primarily in the health care industry can cause acute and chronic liver abnormalities. Hepatitis B virus is a known cause of both acute and chronic liver disease. Workplace exposures to chemicals and infectious agents are also documented causes of liver cancer.

To screen for possible hepatotoxic effects from exposure to workplace chemicals, a "liver profile" or a battery of "liver function tests" are frequently measured. A typical "liver function tests" profile, includes: aspartate aminotransferase (AST, formerly called SGOT or serum glutamic-oxaloacetic transaminase); alanine aminotransferase (ALT, formerly called SGPT or serum glutamic-pyruvic transaminase); alkaline phosphatase (AP); and bilirubin. Occasionally other serum constituents, such as (-glutamyl trans- peptidase (GGT), total bilirubin and fractionation into direct- and indirect-acting components, lactate dehydrogenase (LDH), total protein, and albumin, are also included. Each of these tests has a different specificity and sensitivity for different forms of liver damage. Those tests which reflect the specific type of liver damage should be used to minimize the possibility of abnormal results unrelated to occupational exposure.

The laboratory usually determines the normal ranges for liver tests, therefore normal ranges will vary by laboratory and type of analysis. Some tests are reported in International Units (IU) of activity, whereas others are reported in grams or milligrams per volume. Subtle changes in liver structure and activity may not be measured by these commonly used tests. Both early, mild

changes and late, chronic changes can be missed with the routine panels. To measure for these types of changes, additional testing may be required and while rarely used for screening in our occupational health programs, may be useful for specific exposures.

Tests for the function and integrity of the liver can be divided into three general categories:

1. Tests that detect damage to the hepatocyte, or liver cell;

2. Tests of the liver's capacity to transport organic anions and metabolize chemicals;

3. Tests of the liver's biosynthetic capacity.

Tests that Detect Damage to the Hepatocyte

Injury to the liver from chemical toxicants has classically been divided into two major categories based upon the pattern of changes in liver enzyme activity.

Hepatocellular Injury. Hepatocellular injury is due to the toxicant's effect on all or part of the hepatocyte, including the cell membrane. The aminotransferases, AST and ALT, are the most commonly measured enzymes that detect hepatocellular injury. Elevated serum activity levels can be found whenever there is damage to cells rich in these enzymes, or whenever there are changes in cell permeability resulting in an increased rate of entrance of ALT or AST into the blood. Neither AST or ALT is specific for liver injury. AST is also elevated in injury to cardiac muscle, skeletal muscle, kidneys, brain, pancreas, lungs, and white and red blood cells. ALT, while found predominantly in the liver, is also found in many other tissues. Serum AST activity, and possibly ALT, may be elevated after physical exercise; exercise is thought to be a cause of elevated aminotransferases in runners. Presently, there are no commonly available tests to differentiate the source of elevated amino- transferases, e.g. whether the AST is from liver or muscle cells. AST and ALT are typically elevated in all types of liver disorders, including congestion of the liver due to heart failure and cancer with metastasis to the liver.

Two other commonly measured enzymes, (-glutamyl transpeptidase (GGT) and lactic dehydrogenase (LDH), can be elevated in hepatocellular injury. The GGT, while very sensitive for biliary tract disease, is not very specific for the liver. GGT elevations can be found with disorders of the pancreas, heart, kidney or lung. Isolated GGT elevations have been associated with ethyl alcohol ingestion and exposure to other substances which induce microsomal enzymes, a common group of metabolic enzymes in liver. Because of its lack of specificity, GGT is most useful in confirming the source of alkaline phosphatase elevation as described in the following section. LDH is not as sensitive as the amino-transferases for liver cell injury and is more useful as a marker for myocardial infarction and hemolysis.

Cholestatic Injury. Cholestatic injury, or cholestasis, is caused by changes in liver structure so that the normal secretion or flow of bile is disrupted. Alkaline phosphatase is the most commonly used screening test for cholestatic injury. In the non-pregnant adult, alkaline phosphatase originates in the liver, bone, and intestine, with the liver and bone being the primary sources. The different sources of alkaline phosphatase produce specific isoenzyme forms of the parent enzyme which can be differentiated with special procedures. Serum alkaline phosphatase normally increases in pregnancy and with active growth,

therefore the usual normal levels of alkaline phosphatase do not apply to pregnant women or growing children. Serum alkaline phosphatase levels are generally slightly higher in men than women in the 15 - 50 year old age groups, but this difference usually disappears after age 60. Both sexes over age 60 generally have higher levels than younger age groups.

If serum alkaline phosphatase is elevated without other evidence of liver injury, it is often necessary to identify whether the liver or the bone is the source. Electrophoresis can be done to identify the specific isoenzyme of alkaline phosphatase. Heat or chemical inactivation of the enzyme have also been used because the bone isoenzyme is more heat sensitive than the other isoenzymes. The heat inactivation test may be easily disrupted with minor errors in technique and therefore the results may not always be reliable. A third method to confirm the hepatic source of elevated serum alkaline phosphatase, is to measure the serum activity of other enzymes known to increase in association with liver originating alkaline phosphatase. There are three such enzymes - serum leucine aminopeptidase, 5'-nucleotidase, and (-glutamyl transpeptidase. Each of these enzymes has specific indications and limitations in confirming the hepatic origin of alkaline phosphatase. Further information can be found in any internal medicine textbook.

Tests of the Liver's Capacity to Transport Organic Anions and Metabolize Chemicals

The primary test in this category is serum bilirubin. A variety of clearance tests have also been developed to measure the liver's capacity to remove and detoxify substances from the blood. These include dye, breath, caffeine clearance and serum bile acid tests.

Bilirubin is a breakdown product of heme-containing proteins. Approximately 80% of the bilirubin produced each day originates from the hemoglobin of senescent red blood cells. In the blood, the lipid-soluble bilirubin is bound to albumin and is transported to the liver where it is made water soluble through conjugation to a glucuronide. The conjugated bilirubin is then excreted into the bile and ultimately removed from the body through the feces. A small portion of bilirubin is re-absorbed in the gut as urobilinogen. The conjugated or water soluble bilirubin is the "direct-acting" bilirubin. The "indirect-acting" bilirubin correlates with the unconjugated fraction and is the difference between the total and the direct-acting bilirubin. Overall, bilirubin determinations are not sensitive indicators of hepatic function. Hyperbilirubinemia can be produced through a number of mechanisms, including intravascular hemolysis and bile duct blockage. Gilbert's syndrome, a congenital anomaly found in up to 5% of the population, is associated with increased serum levels of unconjugated bilirubin due to impaired hepatocellular uptake and/or conjugation.

Liver clearance tests and serum bile acids are not considered useful screening tests for the effects of common workplace toxicants. They may be useful for research on occupational liver disease. The dye clearance test currently used is the indocyanine green clearance which has been used in the evaluation of early hepatotoxicity in vinyl chloride exposed employees. This test, which requires intravenous administration of the dye, is generally reserved for research protocols. An older clearance test using sulfo-bromophthalein sodium is no longer used because of toxicity from the dye.

Breath clearance tests use radioactive labelled carbon-containing chemical compounds, which can be administered orally or intravenously, and are metabolized by the liver. Following metabolism, the labelled carbon atom appears in carbon dioxide exhaled from the lungs. The rate of labelled carbon dioxide clearance from the lungs correlates with the rate of chemical metabolism in the liver.

Caffeine is also cleared and metabolized by the liver. Disappearance of caffeine from the serum or saliva after an oral dose has been used to quantify liver function.

Serum bile acid measurements may also be used to evaluate liver function. Bile acids are normally produced by hepatocytes and secreted into the bile. A small proportion of bile acids are reabsorbed in the intestine and removed from the blood by the liver. With liver dysfunction, serum bile acids may be elevated. Measurement of bile acids is useful in management of certain cholestatic liver disorders, mainly primary biliary cirrhosis and primary sclerosing cholangitis.

Tests of the Liver's Biosynthetic Capacity

The liver produces the majority of serum proteins, including albumin, fibrinogen and coagulation factors. Albumin is quantitatively the most important serum protein; the serum level reflects the rate of synthesis, the rate of degradation, and the volume of fluid in the body. Serum albumin levels are generally normal in acute liver disorders. In chronic liver disorders, such as cirrhosis, serum albumin may be low because of decreased synthesis. If ascites is present, serum albumin may be decreased because of increased volume of distribution.

The liver produces many of the known coagulation factors and is also responsible for the clearance of some clotting factors from the blood. Measurement of the prothrombin time evaluates the function of five coagulation factors produced by the liver. Three of these factors also require vitamin K for synthesis of the active form. Therefore in addition to inadequate production of the coagulation proteins, vitamin K deficiency or inhibition may also produce an abnormal prolongation of prothrombin time. Correction of the prothrombin time after administration of parenteral vitamin K differentiates parenchymal liver disease from vitamin K deficiency. Although the prothrombin time is an insensitive indicator of liver disease and may remain normal even in severe chronic liver disease, this test has been found useful as a prognostic indicator in acute hepatocellular disease. Prolongation of the prothrombin time by 5-6 seconds above control may forecast the development of fulminant hepatic necrosis during acute viral hepatitis.

Significance and Evaluation of Abnormal Liver Function Tests

In screening for possible effects of hepatotoxicants, it is important to select the liver function tests with the best combination of specificity and sensitivity. For routine screening of chemicals that are known or suspected to cause hepatocellular injury, the ALT is considered to be the aminotransferase most specific for the liver. To screen for possible cholestatic effects, the alkaline phosphatase, while not the most specific for the liver, is considered the most useful single indicator of cholestasis. Routine screening with "profiles" which also include AST, GGT, bilirubin, LDH and protein determinations, provide limited additional information.

When a liver function test is above the "normal range," the health care provider must decide if this finding is significant. The algorithms in chapter 4, figure (2), will help to evaluate workers with laboratory tests outside the published normal values. Very minor elevations (less than 1.5 times the upper limit of the normal range) may or may not be significant and may or may not warrant repeating the test. To make a decision on the significance of an abnormal test, the health care provider may find useful information through reviewing the individual's previous test results, reviewing the types and levels of exposures to hepatotoxicants, reviewing test results in other similarly exposed employees,

and performing a medical and occupational history and physical examination on the individual with the abnormal test. Since ingestion of ethyl alcohol and many drugs can affect liver function, it is important to obtain accurate information on the use of alcohol beverages and medications.

If, on review of the collected data, an abnormal liver test is thought to be significant and the abnormality persists on a second test, the health care provider may wish to obtain additional tests to confirm the hepatic origin of an abnormally elevated enzyme or order additional tests to help evaluate the extent of liver involvement. If the liver test abnormality could be due to workplace exposures, the tests results of co-workers should be reviewed and an industrial hygienist should be consulted so that all workplace exposures are reviewed. Specific types of liver disease, such as hepatitis A in a food service worker, may require extensive preventive medicine follow-up of co-workers and patrons of the food service.

During the evaluation of abnormal liver tests, some individuals may benefit from a two to four week trial of removal from exposure to known workplace hepatotoxicants or of abstinence from alcohol. If the abnormal tests return to normal after workplace removal, reassessment of occupational exposures and use of protective equipment is essential. If the abnormal liver test is found to be related to alcohol ingestion, the individual should receive appropriate counselling and referral. Individuals with persistent liver test abnormalities should be referred to their physician or a specialist for further evaluation.

B. EVALUATION OF ABNORMAL AUDIOGRAMS

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Introduction

Noise is a common occupational exposure in Navy workplaces, and noise-induced hearing loss (NIHL) is one of the most common occupation-related disabilities. NIHL is a sensorineural hearing loss caused by long-term continuous exposure to noise in excess of 85 decibels (dB) or exposure to impact noise. The early, typical finding in NIHL is a decrease in the hearing threshold at 4000 hertz (Hz) or 4 kilohertz (kHz) on the audiogram. With continued, unprotected

exposure to excessive noise, NIHL progresses (Figure 1). Other forms of occupational hearing loss include conductive hearing loss caused by explosions, trauma or burns, and sensorineural hearing loss caused by exposure to ototoxic substances or blunt head trauma.

All commands, shore and afloat, with noise exposures in excess of specified noise levels are required to have a Hearing Conservation Program as described in OPNAVINST 5100.23 and 5100.19 series respectively. Although the medical department is actively involved in many elements of the hearing conservation program, the occupational health clinic's primary role is in conducting and interpreting audiograms for noise-exposed personnel.

All personnel (civilian and active duty) require a baseline (preplacement or reference) audiogram on placement into a hearing conservation program. Following the baseline audiogram, testing is done periodically (annually, or more frequently, if indicated) and compared to the baseline to detect any changes or shifts in hearing threshold levels. Because of the importance of the baseline audiogram, it is imperative that this test be the highest quality possible. The individual should not have been exposed to noise for at least 14 hours prior to the baseline audiogram. The individual should also fully understand what is expected of him/her during the test, the audiometric equipment should be calibrated and properly functioning, and care should be taken to ensure that noise outside the audio booth does not interfere with testing. Shifts in hearing thresholds from the baseline audiogram may be temporary or permanent. The hearing conservation instruction outlines the procedures for determining a temporary threshold shift (TTS) or a permanent threshold shift (PTS). A threshold shift is considered "significant" if there is a change in hearing thresholds, as compared to the current reference audiogram, of 15 dB or greater in any frequency 1000 through 4000 Hz, or an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear.

What is abnormal hearing? Normal hearing, as measured by audiometry for the Navy's hearing conservation program, is detection of pure tones at the frequencies of 500, 1000, 2000, 3000, 4000 and 6000 Hz at 20 decibels (dB) or less. (Some sources use hearing thresholds of $\leq$ 25 dB as normal hearing.) Classification systems for abnormal hearing or disability related to poor hearing are often based upon hearing thresholds in the normal speech perception frequencies of 500 - 3000 Hz. One classification of abnormal hearing, based upon speech perception threshold, is provided as Figure 2.

When should an individual with abnormal hearing or a change in hearing be referred for further evaluation?

A. The American Academy of Otolaryngology-Head and Neck Surgery has published the following suggested criteria for referral to an audiologist or ear specialist. This organization recommends that the original baseline audiogram, rather than a re-established baseline audiogram, should be used for comparison to identify individuals who will be referred for hearing loss.

<u>Suggested Criteria for Referral to an Audiologist</u>

1. Baseline audiogram

a. Average hearing level at 500, 1000, 2000, and 3000 Hz is greater than 25 dB in either ear.

b. The difference in average hearing level between the better and poorer ears of:

(1) more than 15 dB at 500, 1000, and 2000 Hz; or

(2) more than 30 dB at 3000, 4000, and 6000 hz.

2. Periodic audiogram

Change for the worse in average hearing level, in either ear, compared to the baseline audiogram, of:

a. more than 15 dB at 500, 1000, or 2000 Hz; or

b. more than 20 dB at 3000, 4000 and 6000 Hz.

3. Any audiogram

Variable or inconsistent responses or unusual hearing loss curves.

<u>Suggested Criteria for Referral to a Physician or Ear Specialist</u>

1. History of ear pain, drainage, dizziness, severe persistent tinnitus, sudden, fluctuating or rapidly progressive hearing loss, or feeling of fullness or discomfort in one or both ears within the preceding 12 months.

2. Visible evidence of cerumen accumulation or a foreign body in the ear canal.

A person who has received otologic evaluation previously on the basis of the foregoing criteria should be re-evaluated if he/she develops ear pain, drainage, dizziness, disequilibrium, imbalance or severe persistent tinnitus, or shows significant change in hearing levels defined in the previous section.

B. In addition to the above recommendations, other sources also suggest referral to an audiologist or ear specialist for the following findings on audiogram:

1. Baseline audiogram - hearing loss equal to or exceeding 30, 40, or 50 dB at 3000, 4000, and 6000 Hz, respectively in one or both ears.

2. Any audiogram -

a. Unilateral or asymmetrical hearing loss, an average difference between ears of 40 dB or greater.

b. Any audiogram with a 40 dB or greater threshold at 500 Hz accompanied by a 25 dB or greater threshold at 1000 Hz.

c. Any audiogram with a 40 dB or greater difference between ears at any frequency.

It should be noted that these referral criteria are different than the criteria for referral to physician or audiologist based upon the development of a permanent threshold shift and the requirement for determining if a PTS is noise-related.

Evaluation of Hearing Loss by the Occupational Health Physician. On evaluation of an individual with documented hearing loss, the occupational health physician has two primary concerns:

1. Attempting to identify the etiology of the hearing loss, specifically, is

the hearing loss due to noise exposure (occupational or non-occupational), or any of a variety of medical conditions/exposures associated with hearing loss.

2. Ensuring an appropriate plan for follow-up. In attempting to identify the etiology of the hearing loss, the usual techniques of a thorough history, an appropriate physical examination, and review of all audiograms, usually provide enough information to determine if referral to an audiologist or ear specialist is required.

In the history it is important to inquire about changes in hearing, all sources of noise exposure, family history of hearing loss and exposure to ototoxic substances. The health care provider should complete a general review of systems, especially noting recent infections or subtle problems with the ears, balance and vertigo. On physical examination, blood pressure measurement, examination of the ears and selected neurologic system examinations are usually appropriate. Minor problems, such as cerumen impaction or serous otitis, can often be treated and the individual can have his/her hearing retested.

If the hearing shift persists, the occupational health physician needs to determine the appropriate plan for follow-up. The required plan for follow-up will be based on the differential diagnosis of the hearing loss and may include referral to an audiologist or ear specialist. In some cases the plan may be education, re-fitting of hearing protection and a schedule for repeat hearing tests.

Noise-induced hearing loss is a preventable condition which can lead to significant disability. Whenever the diagnosis of NIHL is made, it is important that the individual is made aware of the diagnosis and is counselled on his/her hearing loss. The individual also needs to be made aware that continued, unprotected exposure to noise, whether occupational or non-occupational, may result in progressive hearing loss. He/she should be encouraged to use hearing protection regularly at work and when engaged in noisy recreational activities.

C. ASBESTOS MEDICAL SURVEILLANCE PROGRAM

References

American Thoracic Society. The Diagnosis of Nonmalignant Diseases Related to Asbestos. *Am Rev Respir Dis.* 1986;134:363-368.

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Introduction

BUMED has tasked the Navy Environmental Health Center (NAVENVIRHLTHCEN) with centrally managing the Navy Asbestos Medical Surveillance Program (AMSP) ashore and afloat. These responsibilities include the following:

1. Providing professional and technical consultation on the medical aspects of occupational exposure to asbestos.

2. Maintaining and analyzing the central registry database containing information on personnel enrolled in the AMSP. This contains data from NAVMED 6260/5 (history and physical evaluation) and NAVMED 6260/7 (roentgenographic interpretation for pneumoconiosis).

3. Certifying equipment and technique of x-ray facilities to take AMSP chest films, and facilitating the forwarding of films for B-readings to NIOSH-certified B-readers.

Criteria for Enrollment in the AMSP

The terms "asbestos current worker" program and "asbestos past worker" program used in this section refer to the medical surveillance programs in NEHC6260 TM96-1. Navy personnel may be placed in the AMSP if they meet any of the following criteria:

1. "Asbestos current worker" program. The criteria for enrollment are contained in the OPNAVINST 5100.23 series.

a. Military and civilian personnel who meet the exposure criteria defined in OPNAVINST 5100.23 series must be included in the AMSP and must remain in the program for "asbestos current worker" as long as the exposure criteria are met.

b. An individual enrolled in the "asbestos current worker" program must be removed from that program if he/she no longer meets the exposure criteria defined in OPNAVINST 5100.23 series. If he/she would like medical evaluation continued, he/she may be enrolled in the "asbestos past worker" program.

2. "Asbestos past worker" program. The Navy has developed a program for individuals with a history of past asbestos exposure in view of the long latent period between the first exposure to asbestos and the development of signs or symptoms of asbestos-related diseases. Placement in the AMSP on the basis of past asbestos exposure is a Navy specific program, i.e., not mandated by OSHA regulations. Enrollment in the program is voluntary, and individuals may request termination at any time. Military and civilian personnel with a history of asbestos exposure may be included in "asbestos past worker" program, based on professional evaluation, if any of the following criteria are met:

a. History of enrollment in the Navy AMSP; or

b. A history of participation, during past federal employment or military service, in any operation where visible airborne asbestos dust was present, including but not limited to rip-outs, for approximately 30 days or more in the past; or

c. The occupational health (OH) provider, with occupational medicine physician and industrial hygiene consultation, as needed, concludes that the individual had exposure to asbestos during past federal employment or military service that met the current OSHA criteria for placement in the medical surveillance program, or its equivalent, for approximately 30 days or more in the past.

Medical Records Table I summarizes the medical records required for workers in the AMSP.

TABLE I
AMSP MEDICAL RECORDS

AMSP FORMS	ASBESTOS "CURRENT WORKER"	ASBESTOS "PAST WORKER"
DD 2493-1	For initial exam. Complete entire form.	Not required.
DD 2493-2	For periodic and termination exam. Complete entire form.	Not required.
NAVMED 6260/5	For all exams. Complete entire form. Forward to NAVENVIRHLTHCEN.	For all exams. Complete entire form. Forward to NAVENVIRHLTHCEN.
NAVMED 6260/7	For all x-ray exams. Complete section 1 and forward with P/A chest film to the B-reader.	For all x-ray exams. Complete section 1 and forward with P/A chest film to the B-reader.
PHYSICIAN'S WRITTEN OPINION	For all exams. Provide employee and employer with a copy.	Not required.

GENERAL MEDICAL FORMS	ASBESTOS "CURRENT WORKER"	ASBESTOS "PAST WORKER"
OPNAV 5100/15 (paragraph 0803.2a.(1))	Include information and update with each AMSP evaluation.	Include information and update with each AMSP evaluation.
SF 600 INDUSTRIAL HYGIENE FORM	Include as available.	Include as available.
NAVMED 6150/20	Document as enrolled in AMSP based on OSHA criteria.	Document as enrolled in AMSP based on past exposure
SF 600 or SF 602	As needed. Use to document findings not recorded on other forms.	As needed. Use to document findings not recorded on other forms.

Criteria for Removal from the AMSP

"Current worker" program. OPNAVINST 5100.23 series details the criteria for removal from the AMSP of personnel who are enrolled in the program on the basis of the OSHA criteria. As detailed in that series, documentation on the medical record and a letter to NAVENVIRHLTHCEN are required when the individual was inappropriately enrolled, or was enrolled because of potential exposure but was never actually exposed.

"Past worker" program. Removal of an individual from the program may be initiated by either the individual or the OH professional.

1. An individual enrolled in the AMSP on the basis of past exposure may be removed from the AMSP at any time that he/she declines further evaluation. In such a situation:

a. A physician's written opinion is not required, but if the staff decides to provide one to the individual, the individual's command should not be provided a copy since the relevant asbestos exposure did not occur during his/her current position.

b. A termination evaluation is not required, but is recommended in certain situations, such as cases with history of heavy asbestos exposures.

c. Document on the medical record the reason(s) for removal from the AMSP. No other documentation is required. NAVENVIRHLTHCEN does not need to be informed that the individual refuses further evaluation.

2. An individual enrolled in the AMSP on the basis of past exposure may be removed from the AMSP if, upon review of available information, the OH professional (with occupational medical physician consultation as needed) concludes that the individual did not meet any of the criteria for inclusion in the program and was therefore inappropriately enrolled. In such a situation:

a. A physician's written opinion is not required, but if the staff decides to provide one to the individual, the individual's command should not be provided a copy.

b. A termination evaluation is not required.

c. Document on the medical record the reason(s) for removal from the AMSP.

d. Forward the individual's name and social security number to NAVENVIR-HLTHCEN stating the reason(s) for removal from the AMSP.

Asbestosis

The AMSP is directed primarily towards the early recognition of asbestosis. The following guidelines on asbestosis are adapted from those published by the American Thoracic Society (ATS):

Asbestosis is defined as interstitial fibrosis of the pulmonary parenchyma in which asbestos bodies or fibers may be demonstrated. When pathological findings are not available, as is generally the case, the diagnosis of asbestosis is a judgement based on consideration of all relevant clinical findings.

In making a diagnosis of asbestosis, there must be:

1. A reliable history of exposure, and

2. An appropriate time interval between exposure and detection (usually ten years or more).

In addition, the following are of recognized clinical value:

1. Chest roentgenographic evidence of type "s", "t", or "u", small irregular opacifications of a profusion of 1/1 or greater (ILO Classification of Pneumonoconioses - 1980)

2. A restrictive pattern of lung impairment with a forced vital capacity below the lower limit of normal

3. A diffusing capacity below the lower limit of normal

4. Bilateral late or pan inspiratory crackles at the posterior lung bases not cleared by cough.

The chest roentgenographic findings are considered the single most important clinical criterion. When it is not met, considerable caution is warranted. The specificity of roentgenographic findings increases with increasing number of positive criteria. As in all clinical judgements, confounding variables, such as the presence of other clinical conditions that affect these criteria, should be evaluated.

Pleural Abnormalities

Pleural abnormalities are often associated with parenchymal disease, but are different in epidemiology, clinical features, and prognosis. Exposure to asbestos may cause the following benign pleural abnormalities:

1. Pleural plaques. These are discrete, rounded lesions, usually bilateral, most often found on the posterolateral aspect of the lower parietal pleura or diaphragm. They are not believed to be pre-malignant lesions. Pleural plaques are well established markers for asbestos exposure and are usually detected in asymptomatic individuals on routine chest roentgenography. The finding of pleural plaques on chest roentgenography is not, by itself, an indication to refer for further evaluation.

2. Pleural thickening. This is a focal or diffuse fibrosis of the visceral pleura with involvement from the apex to the base. Pleural thickening may impair pulmonary function and cause symptoms. Since many other disease processes can cause pleural fibrosis, the finding of diffuse pleural thickening on chest roentgenography is non-specific and is not necessarily related to asbestos exposure.

3. Pleural effusions. These are early manifestations of asbestos exposure and are characteristically unilateral sterile exudates. Other disease processes can cause pleural effusion and a careful evaluation for other causes, such as lung cancer or tuberculosis, should be undertaken before an effusion is attributed to asbestos exposure.

Lung Cancer

Lung cancer risk is related to asbestos exposure in a linear, dose-related

fashion. There is a synergistic effect of smoking and asbestos exposure on the development of lung cancer. Smoking significantly increases the risk of lung cancer. The latency period is seldom less than ten years and is usually over twenty years.

Mesothelioma

Most malignant mesotheliomas of the pleural and peritoneal cavities are associated with exposure to asbestos. Cases may occur from transient exposure to asbestos. Cigarette smoking appears unrelated to the development of mesotheliomas. The latency period is usually greater than twenty years and is often as long as thirty or forty years after exposure.

Other Malignancies

Some studies have associated asbestos exposure with excess cancers of the gastrointestinal tract and kidney. These studies are not considered conclusive.

B-readings

Individuals with pulmonary signs and symptoms from acute illnesses should not be scheduled for an AMSP x-ray until the illness has cleared up, to avoid x-ray findings which may cloud the pneumoconioses findings.

NAVENVIRHLTHCEN contracts with NIOSH-certified B-readers to read all AMSP films using the ILO classification for pneumoconioses. All films must be read by the local radiologist before they are mailed for B-readings.

The B-reading is designed for epidemiological purposes, not for clinical evaluation. If the B-reading is significantly different from the reading of the local radiologist, the local radiologist should be asked to review the film. Because the local radiologist has access to information about the individual's history, physical examination and previous x-rays, and can take further x-rays if needed, his/her interpretation of the chest film is more important for clinical diagnosis than the B-reader's interpretation. Further action will depend on the clinical judgement of the examining physician. Referral to a pulmonary specialist may be indicated.

C-readings

The technique used for taking AMSP films is different from those used for other purposes. Therefore, a medical facility can take AMSP x-rays only after its equipment and technique have been certified by NAVENVIRHLTHCEN. This is done by submitting films for C-readings.

Routine recertification is not required. Recertification is required when the x-ray equipment is changed or significantly modified. When NAVENVIRHLTHCEN identifies a problem with film quality, recertification may be required. The procedures for recertification of equipment and technique are the same as for the initial certification.

AMSP Certification of the Radiology Technique and Equipment

The following procedures must be followed by medical facilities applying for AMSP certification:

1. Facilities must submit to NAVENVIRHLTHCEN six AMSP posterior/anterior (P/A) chest films for evaluation and B-reading interpretation. Table II describes the

imaging systems and x-ray technique necessary to produce the optimum interpretation quality.

2. A NAVMED 6260/7 form and Table III form must be completed and forwarded to NAVENVIRHLTHCEN with each P/A chest film. The Table III form provides information on the imaging system, type of machine, technique, processing and Quality Assurance for the consulting radiologist.

3. NAVENVIRHLTHCEN forwards the submitted films and forms to a consulting radiologist (C-reader). If the C-reader determines that the films meet the ILO 1980 classification standards, the medical facility will be certified to take AMSP films. The C-reader's interpretation of readable films will be recorded on the NAVMED 6260/7 forms.

4. The C-reader's recommendations will be conveyed via NAVENVIRHLTHCEN letter to the submitting facility with the films and completed NAVMED 6260/7 forms. This letter will either notify the facility certifying its x-ray equipment and technique, or identify reasons for denying the certification. The letter providing certification includes detailed information for obtaining delivery orders and routinely sending chest films for B-readings under the NAVENVIRHLTHCEN centrally administered contract. A copy of this approval letter should be kept on file in the x-ray department.

Contact NAVENVIRHLTHCEN when questions arise concerning the certification status of a facility.

Table II
Imaging System and X-Ray Technique Recommendations

Parameter	Recommendation or Requirement
Film	Medium or high speed
Screen	Medium or high speed
Grid	
Ratio	8:1 or 12:1
Lines/inch	100 - 103
Focal film distance	72 inches
Film size	14 inches X 17 inches
Film holder	Adjustable; cassette capable of being positioned vertically or horizontally
Projection	Posterior-anterior chest
Anode	Rotating
Focal spot size	Maximum 2 millimeters
Filtration	Minimum 2.5 millimeters aluminum
Time	a. Less than 1/20 second b. 1/10 second if single phase and less generator capacity than 300 milliamperes at 125 kilovolt peak or patient greater than 28 centimeters
Milliamperes	300 or greater
Kilovoltage	120 or greater

Table III
X-Ray Technique and Equipment Questionnaire

1. Settings of chest film forwarded for evaluation:

a. Phototimer system used:

YES_____	**NO**_____
Milliamperes_____	**Milliamperes**_____
Backup Time_____	**Time**_____
Kilovolt Peak_____	**Milliamperes-seconds(mAs)**____
	Kilovolt Peak_____

b. Focal Film Distance _____ **Filtration**_____

2. Type of equipment:

a. Manufacturer_____**Model**_____

b. Generator type: Single phase_____
Three phase_____
Other (specify)_____

c. Automatic collimation available: Yes_____ **No**_____

d. Films/intensifying screens used_____

e. Grid used: Ratio _____**Lines/inch**_____

f. Maintenance provided by_____

3. Workload:

a. Radiographs:
Number of <u>all types</u> of films per week_____
Number of <u>chest</u> films per week_____

b. Retake rate: Percentage of films retaken_____

4. Darkroom:

a. Type of processing: Automatic_____ **Manual**_____

Manufacturer_____ **Model**_____

Type thermometer_____ **Type timer**_____

b. Maintenance:
Frequency for changing chemicals_____
Maintenance performed by:_____
Technician_____
Medical repair technician_____
Service contract_____

B-reading protocol

MTFs certified to take AMSP x-rays must follow the procedures listed below to obtain B-readings:

1. Use SF-519A and NAVMED 6260/7 Report Form (Stock Number 0105-LF-009-9900) to order routine posterior/anterior (P/A) chest x-rays for individuals in the AMSP. Complete Section I of NAVMED 6260/7.

2. Do not ask the B-reader to make comparisons with old films. Do not forward other radiology reports, x-rays or related information. All additional x-rays and consultations are the responsibility of the examining physician, in consultation with the local radiologist as needed.

3. Follow the procedures below in preparing AMSP chest films for B-readings:

a. The local radiologist must read the films before they are forwarded to the B-reader. Use routine procedures established by the x-ray department to track films checked out of the department.

b. Forward only the P/A chest films and NAVMED 6260/7s to the B reader. You must always send both the original and copy of the NAVMED 6260/7 to the B-reader. Do not send the films to NAVENVIRHLTHCEN.

c. To obtain authorization for mailing AMSP chest films to the B reader, use the sample letter on the following page to request the DD 1155 (delivery order) from NAVENVIRHLTHCEN. The number of radiograph evaluations you request in the letter will be entered in block 19 of DD 1155. If the number of AMSP chest evaluations varies from the number on the DD 1155, contact NAVENVIRHLTHCEN to have the order modified before you ship the films and DD 1155 to the B-reader. Failure to comply could result in an unauthorized procurement with funding charged to your activity.

d. Each chest film must have an accompanying NAVMED 6260/7 with all of Section I completed. If two exposures are required to obtain the P/A chest film, count these two chest films as one chest film, and prepare one NAVMED 6260/7 to request one evaluation. Place the NAVMED 6260/7 on top of each corresponding film (do not staple form to film) and stack up to 25 films in one x-ray jacket for efficient packaging. This will enable a mailing case to hold up to 100 AMSP films and forms. The B-reader is not responsible for sorting forms to match films. Films must be securely packed in the film mailing case. Mailing cases are furnished by the NAVENVIRHLTHCEN upon request.

e. AMSP films should be forwarded at least monthly in batches of 10 to 100 films. Facilities having less than 10 films in a month may batch those films with other facilities. Please contact NAVENVIRHLTHCEN to identify other clinics taking AMSP films in your area, if needed.

f. Prepare a mailing label for the x-ray mailer case, containing the B-reader address (found in block 9 of the DD 1155.) Prepare a second mailing label with your address to be used by the B-reader in returning the AMSP chest films and NAVMED 6260/7s. Place the second label in the mailing case with the films, NAVMED 6260/7s and DD 1155.

g. The films to the B-reader must always be mailed certified "priority 13" since films must be traceable in case they are lost in the mail. The DD 1155 must be used within 14 days (21 days for overseas activities) from the date found in block 3 of the DD 1155.

3. The B-reader has thirty days to read the films. If the films and original NAVMED 6260/7s are not returned within two (2) months from the date you mailed the films, or by the date in block 10 of the order document DD 1155, contact NAVENVIRHLTHCEN.

4. B-reader interpretations (NAVMED 6260/7) are medical documents which must be incorporated into the permanent health record after review by the medical health provider.

Requests for Authorization to Ship X-rays for B-readings

Requests must be in writing and forwarded to NAVENVIRHLTHCEN by speed letter, regular mail, naval message, or telefax (Telefax: (804) 445-6873). An authorized signature is required unless the request is by naval message.

The format used in the following sample letter must be used to request authorization to ship AMSP chest x-rays for B-readings. Paragraph 1 requires information on the quantity of radiograph evaluations. If two exposures are required for an individual, count these two chest films as one. Use the UIC of the MTF shipping the AMSP chest x-ray.

DATE: UIC:

From: (REQUESTING ACTIVITY) (Provide complete mailing address including building number, etc.)

**To: Contracting Officer, Navy Environmental Health Center,
2510 Walmer Avenue, Norfolk, Virginia 23513-2617**

Subj: REQUEST FOR AUTHORITY TO SHIP ASBESTOS X-RAYS FOR B-READINGS

Ref: (a) OPNAVINST 5100.23D Chapter 17

1. Per reference (a), (REQUESTING ACTIVITY) has a total of (QUANTITY) chest radiograph evaluations available for shipping to the designated B-reader. The requested delivery date is (DATE: 45 days from the date of your request letter), Priority 13.

2. Please forward the order document (DD 1155) and the Chest Film Protocol for the AMSP.

3. Point of contact _____
Telephone: DSN: _____ COMM: ( )_____
Telefax: DSN: _____ COMM: ( )_____

AUTHORIZED SIGNATURE

D. EVALUATION OF CHOLINESTERASE LEVELS

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Mechanism of Action

Most of the toxic effects of organophosphate and carbamate pesticides are due to their ability to inhibit the activity of acetylcholinesterase, an enzyme which normally inactivates acetylcholine. Acetylcholine is the neurotransmitter at the postganglionic parasympathetic nerve endings, preganglionic nerves to parasympathetic and sympathetic ganglia, somatic nerve endings to striated muscle, and certain central nervous system (CNS) synapses. When cholinesterase activity is inhibited, acetylcholine accumulates at cholinergic synapses, resulting in stimulation, then paralysis of transmission in those synapses.

Routes of Absorption

Organophosphates are absorbed through the respiratory and gastrointestinal tracts, skin and conjunctival mucosa. Toxicity has been reported from skin absorption of organophosphates on clothing that had been laundered after contamination.

Carbamates are absorbed through the respiratory and gastrointestinal tracts. They are not appreciably absorbed through intact skin, but absorption may be increased in cases of dermatitis.

Elements of Medical Evaluation

Workers undergo physical examinations before exposure and annually. The elements of the examination are contained in NEHC6260 TM96-1.

Cholinesterase levels are determined before exposure and at periodic intervals depending on the type and frequency of exposure. OPNAVINST 6250.4A contains the guidelines to be followed when monitoring cholinesterase levels.

Significance of Cholinesterase Levels

The medical surveillance program tests for two kinds of cholinesterase:

1. Acetylcholinesterase (RBC cholinesterase) is found in the nervous system and red blood cells (RBC).

2. Butyrylcholinesterase (plasma cholinesterase, pseudocholinesterase) is found in the liver and plasma.

The syndrome observed with organophosphate or carbamate toxicity is due to the inhibition of acetylcholinesterase in the nervous system. Since this cannot be measured, RBC cholinesterase and plasma cholinesterase are used as surrogates in testing. Cholinesterase in the nervous system is reflected better by RBC cholinesterase than by plasma cholinesterase. Measurement of both is recommended because each yields different information:

1. Organophosphate and carbamate pesticides may cause a decline of RBC cholinesterase, plasma cholinesterase or both.

2, Plasma cholinesterase declines and returns to baseline values more rapidly than RBC cholinesterase. If there is complete inhibition of RBC cholinesterase by organophosphates, recovery takes place at the same rate as new RBC regeneration (approximately 1% per day). Plasma cholinesterase regenerates approximately 25% in the first 7 - 10 days.

Development of symptoms depends more upon the rate of decline in cholinesterase activity than upon the amount of the decline.

<u>Considerations in the Interpretation of Laboratory Tests</u>

1. Normal laboratory values show a wide range, varying with the method and the laboratory. Therefore, it is preferable to compare a worker's follow-up cholinesterase values with his/her baseline (obtained before exposure) rather than with the laboratory "normal" values. Cases have been reported of individuals whose cholinesterase levels are significantly depressed from their baseline, but fall within the laboratory range of normal.

2. Two baseline tests are recommended because for the same individual, cholinesterase values can vary by as much as 10 - 15%.

3. When baseline studies are not available for an individual who was overexposed to organophosphate, serial cholinesterase monitoring is advised. A rise in cholinesterase values indicates that there was post-exposure cholinesterase depression.

4. The complex formed by carbamates with cholinesterase is unstable. Cholinesterase monitoring is not helpful if a worker is exposed only to carbamates, unless the specimen can be examined within a few hours.

5. Decreased cholinesterase values have been reported in the following:

a. RBC and/or plasma cholinesterase - Overexposure to organophosphate or carbamate pesticides

b. RBC cholinesterase - anemia (if the cholinesterase measurement is not corrected for the hematocrit), quinine.

c. Plasma cholinesterase - liver damage, malnutrition, foods with xanthine related compounds (coffee, chocolate, tea), drugs (morphine, codeine, thiamine,

ether, chloroquine), chemicals (organic mercury compounds, carbon disulfide, benzalkonium salts), acute infections, some types of anemia, stomach and kidney cancer.

6. Increased cholinesterase values have been reported in the following:

a. RBC cholinesterase - chronic low level exposure (as much as 10% above baseline).

b. Plasma cholinesterase - exercise, nephrotic syndrome.

APPENDIX E

TRAVEL MEDICINE

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Travel Guidance

Navy Environmental Health Center
2510 Walmer Ave., Suite A

Norfolk, VA 23513-2617
Comm: (804) 363-5604; DSN: 864-5604

Navy Environmental and Preventive Medicine Unit Two
1887 Powhatan St.
Norfolk, VA 23511-3394
Comm: (804) 444-7671; DSN: 564-7671
(Caribbean, Central and South America)

Navy Environmental and Preventive Medicine Unit Five
3035 Albacore Alley
San Diego, CA 92136-5199
Comm: (619) 556-7071
(Canada and Mexico)

Navy Environmental and Preventive Medicine Unit Six
Box 112, Naval Station
Pearl Harbor, HI 96860
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(Pacific, SE Asia to India)

Navy Environmental and Preventive Medicine Unit Seven
PSC 824 Box 2760
FPO AE 09623
Comm: 011-39-95-56-4101/4099
(Europe, Africa, Middle East, USSR)

Armed Forces Medical Intelligence Center (AFMIC)
Fort Detrick, MD 22701-5004
Comm: (301) 663-7511; DSN: 343-7511

Introduction

Travel medicine or "emporiatrics" is a relatively new and rapidly developing field which relies heavily on up-to-date knowledge of area-specific health risks. A recent survey of North American travel health advisors found that immunization recommendations were inadequate or inappropriate in 20-75% of cases, 20-60% of antimalarial recommendations were incorrect, and issues such as altitude sickness, sunscreens and safe sex were infrequently discussed (Keystone, Dismukes and Sawyer).

This section contains a general discussion of issues to be considered in any traveler. More detailed information on various topics can be found in the references listed above.

Beyond these general considerations, the occupational medicine practitioner may be called upon to assess the fitness of an individual for overseas work where a more extensive review of physical and psychological factors would be required. Expatriates may be required to spend extended periods of time in underdeveloped areas where long-term public health issues need to be considered (Krieger and Balge). Large scale military undertakings can be expected to result in a variety of biological and non-biological exposures. For example, besides the expected disease risks, Desert Storm troops were exposed to oil well fire smoke. In these instances, the collaboration of preventive medicine and occupational health experts would be ideal. Although beyond the scope of this appendix, such issues are "travel medicine" in the largest sense.

General Considerations

Review the trip. Consider location (rural, urban), terrain, environmental

threats, length and purpose of stay. What is the expected quality of food, water, accommodations and medical services? Assess the risk of exposure to disease vectors, animals and other health threats. Review the health status of the traveler with respect to underlying illness, allergies, medications and special considerations such as pregnancy. Plan far enough in advance to allow time for education, immunizations and general preparation. Ensure that immunizations and medications are documented in the traveler's health record.

Before leaving. Provide necessary immunizations. Advise traveler to begin prophylaxis if necessary, update insurance, wills, letters of instruction, powers of attorney and similar documents, establish points of contact (medical facilities, embassies) at destination, assemble appropriate clothing, required medications, first aid supplies, personal protection (sunscreen, insect repellent), hygiene items, other necessities (spare eyeglasses and contact lenses) and health records. The traveler must be prepared for culture shock.

While traveling. Injuries are the most common form of morbidity associated with travel, and for American travelers, traffic accidents are the most frequent cause of death. The traveler must know effective practices to prevent food, water, and vector-borne illnesses. Stress precautions against HIV infection and other sexually transmitted diseases (STDs). If necessary, employ strategies to moderate motion sickness and jet lag.

Upon return. Continue required malaria chemoprophylaxis. Depending on length of stay and perceived exposures, re-entry health evaluation and specific testing (e.g., PPD) may be justified. If illness occurs within a year of return, ensure that the complete travel history is related to the physician.

Immunizations

General. Immunizations are recommended because of exposure risks anticipated during travel or because they are required to enter certain countries. Evaluate the traveler thoroughly regarding contraindications to immunization, including allergies (eggs, thimerosal), pregnancy (current or intended) and immunocompetency. Ascertain the general medical condition as well as any medication use.

Cholera. Currently, no country or territory requires cholera vaccination as a condition for entry, although local authorities may require documentation of vaccination. The current inactivated, parenteral vaccine has low efficacy. Food and water precautions are the major preventive measures.

Hepatitis A. The primary immunization for adults consists of one dose with a booster recommended six months later. Candidates for immunization include those likely to make repeated trips over an extended period to hepatitis endemic areas, and those residing in endemic areas. Immune globulin is an acceptable alternative.

Hepatitis B. The inactivated virus vaccine is indicated for persons living in an endemic area for more than six months, and those with a potential for sexual exposure or contact with local blood products. The vaccine series requires six months to complete. Immunization also protects against hepatitis D. There are no vaccines yet developed for the hepatitis C and E viruses.

Japanese Encephalitis (JE). JE is prevalent in areas where rice culture (mosquito breeding sites) and pig farming (animal reservoir) coincide. Vaccination should only be considered for persons who plan to live in areas where JE is endemic or epidemic, and for travelers whose activities include trips into rural, farming areas. Despite immunization status, personal protection should still be vigorously practiced.

Meningococcal Disease. Meningococcal vaccine is recommended for travel to areas with epidemic meningococcal disease. Sub-saharan Africa, from Senegal to Somalia is known as the meningococcal meningitis belt. Other areas of risk include Saudi Arabia, Kenya and Tanzania, Northern India, Nepal and some sub-Amazonian regions of South America. The quadrivalent polysaccharide vaccine is effective against serogroups A, C, Y, and W-135. It does not protect against serogroup B.

Plague. Travelers to India and other plague endemic countries in Africa, South America, and Asia are at low risk for infection. Use of insect repellents and avoidance of sick or dead animals are primary preventive measures. The inactivated bacterial vaccine is of unproven efficacy and, for adults, prophylaxis with tetracycline or doxycycline is preferred.

Rabies. Rabies is enzootic throughout the developing world and should be suspected in any animal bite, especially dogs. Pre-exposure prophylaxis with the Human Diploid Cell Vaccine (HDCV) is recommended in endemic areas if there is an occupational risk of exposure (hunters, forest rangers, taxidermists, laboratory workers, stock breeders, slaughterhouse workers, veterinarians and spelunkers). Administration of routine booster doses depends on the individual's exposure risk. Post-exposure treatment requires thorough cleansing of all wounds with soap and water, and administration of both Rabies Immune Globulin (RIG) and HDCV. Anti-malarial agents (chloroquine and mefloquine) can interfere with development of active immunity following intradermal immunization, which is sometimes used as a pre-exposure regimen.

Smallpox. This disease has been eradicated worldwide, so no vaccination is required.

Typhoid. Although the majority of cases of typhoid fever in the United States occur among international travelers, it is still relatively rare. The live, oral form (Ty21a vaccine) requires refrigeration. The initial series takes a week to complete and cannot be given concurrently with oral polio vaccine or antibiotics. It cannot be given to immunocompromised persons. It may interfere with malaria chemoprophylaxis. The vaccine should be considered in travelers going to endemic areas for extended periods especially if going off the usual tourist routes. It is contraindicated in pregnancy. The acellular vaccine is given as a single IM injection for individuals two years and older.

Yellow fever. Human yellow fever is transmitted only in Africa and South America. Country specific vaccination requirements are published in the "Health Information for International Travel." An update of countries with active transmission of yellow fever (also cholera and plague) is found in the "Summary of Health Information International Travel (the "blue sheet") printed bi-weekly by the CDC. The yellow fever vaccine is an attenuated live virus vaccine grown in chick embryos. Boosters are required every ten years. The vaccine is contraindicated in immunocompromised persons, those with a history of allergies to eggs and in pregnancy.

Traveler's Diarrhea (TD)

Background. Traveler's Diarrhea usually refers to enteric illness acquired when traveling from an industrialized to a non-industrialized area. In general, TD will be experienced by approximately half of all travelers visiting developing countries. Bacterial pathogens are the most significant cause, especially enterotoxigenic E. coli (ETEC).

Prevention. Avoidance of high-risk food and beverages is critical for prevention of TD. The safest foods are those served at a temperature too hot to

eat at first. In high risk areas, foods maintained at room temperature, milk (which may also cause brucellosis if unpasteurized), tap water, and ice are all items to be avoided. The decision to use chemoprophylaxis must be individualized for each traveler. The same drugs are employed as those used for therapy, but in half the recommended dose. In Mexico, trimethoprim sulfamethoxazole (TMP-SMX) may be used. In other high-risk parts of the world, fluoroquinolones are recommended for adults. Bismuth subsalicylate is a second option.

Therapy. Rehydration with fluids and electrolytes is the mainstay of therapy. For more significant disease, treatment choices include bismuth subsalicylate alone, an antiperistaltic alone or in conjunction with an antimicrobial. When travel is to Mexico in the rainy season, TMP-SMX is the drug of choice. Antimicrobial therapy is not recommended for small children or pregnant women.

Malaria

Personal Protection. Arthropod avoidance and personal protective measures form the first line of defense against malaria. The most effective repellents for topical use contain DEET (N,N-Diethyl-m- toluamide). Clothing and bednetting impregnated with permethrin are effective in killing or repelling mosquitoes and other arthropods.

Chemoprophylaxis and Emergency Treatment. Chemoprophylaxis is a misnomer in that antimalarial drugs used during the period of exposure kill parasites in the erythrocytic phase, thereby preventing acute infection, but do not prevent ongoing hepatocyte infection. It is therefore necessary to continue prophylaxis for a period of weeks after leaving the malarious area to eradicate parasites emerging from the hepatic stage. Primaquine is taken to eradicate latent P. vivax or P. ovale infection in liver cells. Three drugs are available in the United States to prevent acute infection of erythrocytes: chloroquine, mefloquine and doxycycline. These are started before traveling in order to achieve adequate blood levels and to assess tolerance. They are continued during and after the exposure period for the reasons discussed above. If primaquine is indicated in the post-exposure period, the G6PD status must be known since severe hemolysis may occur if used in persons deficient in this enzyme.

For a traveler visiting areas where medical attention is not readily available, Fansidar (pyrimethamine/sulfadoxine) may be supplied for emergency treatment in the event of a febrile illness. Because of complex issues involving malaria prevalence, species predominance and drug resistance, access to sources of current knowledge is essential for proper recommendations.

Tuberculosis

Transmission of tuberculosis usually requires prolonged, close contact with an active case, and the risk to most travelers is therefore very low. However, for persons residing for more than a few days in developing countries, especially in areas of high AIDS prevalence, a pre-departure determination of PPD status is indicated. Since a reactive tuberculin skin test may take several weeks after infection to become positive, follow-up testing should be delayed for three months after return.

Leishmaniasis

Leishmaniasis is a parasitic disease found in tropical and sub-tropical areas of the world. It is transmitted by the bite of phlebotomine sandflies. Manifestation of the disease may take months, or in the case of visceral leishmaniasis, even years to develop. No vaccines are currently available. As

with malaria, outdoor activity should be avoided when biting is most active (dusk to dawn). Preventive measures are also similar (clothing, DEET, permethrin) except that the smaller size of the sandfly requires finer-mesh bednetting.

Schistosomiasis

Schistosomiasis is spread by contact with fresh water containing larvae (cercariae) released by infected snails. Effective treatment is available. Since there is no way to determine if water is contaminated, bathing in fresh water should be avoided in all endemic areas. If accidental contact occurs, vigorous toweling of the skin should be done immediately to reduce cercarial penetration. Swimming in chlorinated pools is safe, as is bathing in water allowed to stand for 3 days.

Dengue

Dengue fever is a viral disease transmitted by urban Aedes mosquitoes. The most common vector is Aedes aegypti (also the vector of urban yellow fever) an indoor breeder and daytime biter. There are four dengue viruses which do not cross-react. The disease is usually self-limited, and treatment is symptomatic. Dengue hemorrhagic fever (DHF) presents with the same symptoms as dengue fever but progresses to hemorrhage and hypovolemic shock. The risk to travelers is small, but in endemic areas precautions against mosquito bites should be taken.

Sunburn and Heat

The prevention of penetrating UV rays is essential in minimizing the effects on skin and eyesight. UVB radiation is responsible for tanning and burning skin. Drugs such as tetracyclines and sulfonamides can provoke a UVA phototoxic reaction resembling an exaggerated sunburn. Sun screens with a Sun Protection Factor (SPF) of 15 or greater should be used before sun exposure. Long-sleeved shirts, trousers and hats will also decrease UV penetration. Heat cramps, heat exhaustion and heat stroke are other potential hazards.

Sexually Transmitted Diseases

The most common STDs, gonorrhea, syphilis, Chlamydia and herpes are found worldwide. Others, such as chancroid and lymphogranuloma venereum are most often encountered in developing countries. In some areas of Africa, HIV infection in prostitutes exceeds 50%. While abstinence is the only sure prevention, the potential for sexual encounters needs to be realistically addressed. Guidance includes the use of latex condoms, spermicides and avoidance of high-risk practices such as anal intercourse. Hepatitis B vaccination may be indicated if travel is prolonged and sexual contact is anticipated.

Motion Sickness

The symptoms of motion sickness can be reduced by keeping the head stationary, watching the horizon and sitting in the most stable part of the vehicle. Medication to prevent motion sickness needs to be started before travel. The effects of scopolamine patches (Transderm Scop) may extend beyond the pharmacologic life of the patch. Their use is contraindicated in certain conditions.

Jet Lag

The is no apparent difference in the frequency or severity of symptoms (fatigue, insomnia, asynchrony in appetite and bowel function) going east or west if four or more time zones are crossed. For shorter trips going in the direction

of the sun (east to west) may produce fewer symptoms. Avoiding excessive sitting, food and drink (except water which should be forced) is important. Sleeping aids for flights greater than six hours may be helpful but the combination of triazolam (Halcion) and alcohol may produce retrograde amnesia. Sleeping aids are probably more useful after arrival. The traveler should assume local sleeping and eating schedules on the day after arrival and an acclimatization period of 1-2 days should be allowed at the destination before conducting business or further travel.

Altitude Sickness

Traveling in high altitudes (>8000 feet) may lead to a continuum of diseases beginning with acute mountain sickness (AMS) and continuing to high altitude pulmonary or cerebral edema. Individual susceptibility is highly variable. Travelers who are at greatest risk are those who ascend rapidly to tourist sites in the Andes and Himalayas. Climbers should spend a few days at 5000-7000 feet and then gradually ascend. Acetazolamide (Diamox) can hasten the process of acclimatization to high altitudes. The recommended dosage to prevent acute mountain sickness is 250 mg every 8-12 hours. The medication should be started 24-48 hours before ascent and continued during the climb. It may cause tingling in fingers and toes.

Individual Travel Issues

Pre-existing Illness. Persons with severe pulmonary disease should consider traveling by means other than flying which can make symptoms worse because of the reduction in available oxygen, low humidity, and secondary smoke. Cardiac patients should not fly if there is a history of recent myocardial infarction, unstable angina or uncontrolled congestive heart failure or arrhythmias. If flying is undertaken, supplemental oxygen should be ordered from the airline 2-3 days in advance. All required medications should be on board, not packed with checked luggage. Cardiac patients should also have a copy of a recent EKG. Changes in time zones and daily schedules will affect everyone taking medications. For diabetics, one option is to maintain the usual insulin schedule until departure, snack frequently while traveling and monitor glucose every 6 hours, between meals and/or 2 hours after meals. Smaller doses of regular insulin can be used until arrival at the destination when the usual schedule may be resumed.

Pregnancy. The normal anatomic and physical changes of pregnancy expose women to various risks during travel. Since travel is associated with prolonged sitting, pregnant women should walk and stretch frequently to avoid the propensity for deep venous thrombosis. Air travel exposes women to pressures equivalent to 6000-8000 feet above sea level. The associated drop in arterial blood PO2 may pose a risk to the fetus if the mother is anemic. Other problems include a reduction in placental blood flow if dehydration associated with low cabin humidity is not countered. Immunizations should be avoided, especially during the first trimester. Live viruses are contraindicated except when the risk of infection is unavoidable. Passive immunization with immunoglobulins is an acceptable alternative. Inactivated vaccines and toxoids are safe. Pregnant women are advised not to travel to malarious areas.

Tips and Traps for Vaccines for International Travel

! **Infants and children** traveling outside of the United States should be current on their routine childhood immunizations, and may need additional vaccines depending on their itinerary.

! **Adults >18 years** of age traveling outside the United States should be current on their tetanus-diphtheria vaccine (primary series and booster every 10 years). They may also need 1 or 2 doses of measles-mumps-rubella (MMR) vaccine (if born after 1956), influenza and pneumococcal vaccines (if >65 years of age or with certain underlying medical conditions), and may need additional vaccines depending on their itineraries.

! By International Health Regulation, only **yellow fever vaccine** may be required for a traveler to be allowed to enter a country. No country or territory currently requires cholera vaccination as a condition for entry. However, some local health authorities may require evidence of cholera vaccination.

! **Visa requirements may differ from entry requirements,** and may include tests, such as tuberculin skin testing and serologic testing for human immunodeficiency virus.

! Always **list the traveler's itinerary in the order** in which the countries will be visited. Some countries require yellow fever vaccine only if the traveler is arriving from an area infected with yellow fever.

! Always check both the yellow section of Health Information for International Travel and the biweekly Summary of Health Information for Internal Travel (also known as the Blue Sheet) for a listing of vaccination requirements and current **areas infected with yellow fever**.

! Only vaccine doses verified by **written documentation** should be counted. If vaccine doses are not documented, the person should be assumed to be unvaccinated.

! **All vaccines may be administered simultaneously**, except cholera and yellow fever, which should be separated by at least 4 weeks.

! It is not necessary to restart the series of any vaccine due to **extended intervals between doses**. However, vaccine doses spaced too close together may produce less than optimal protection. Consult Table 10 of the General Recommendations on Immunization (1994) to determine the minimum intervals between doses of a multi-dose vaccine.

! If **live virus vaccines** are not administered on the same day, they should be separated by 4 weeks. An exception to this rule is oral polio vaccine (OPV) which may be administered at any time before or after other live virus vaccines, including Ty21 a oral typhoid vaccine.

! **Live virus vaccines** require 2-3 weeks to produce an adequate immune response.

! **MMR and varicella vaccine**s given prior to the first birthday should not be counted. The

child should be revaccinated at 12-15 months of age.

! **Measles-mumps-rubella (MMR) vaccine** may reduce the response to PPD, so may lead to a false negative tuberculin skin test (TST). MMR may be given before, or on the same day as a TST. If a MMR has been applied, TST should be delayed for at least 4 weeks.

! In general, live virus vaccines are contraindicated in **pregnant women**. Under some circumstances, yellow fever and oral polio vaccines may be considered. Inactivated vaccines may be administered to Pregnant women.

! **Immune globulin** (IG) may inactivate live measles-mumps-rubella (MMR) and varicella vaccines. These vaccines must be given at least 2 weeks before IG is administered, and delayed at least 3 months after IG is administered.

! Adults who have documentation of a prior complete series of **polio vaccine** need only a single booster dose after age 18 years. It is not necessary to give additional polio vaccine for subsequent travel. Adults >18 years of age who cannot document a complete series of polio vaccine as a child should be given a primary series of 3 doses of inactivated polio vaccine (IPV).

! The adult booster dose of **polio vaccine** should be the same type of vaccine (inactivated or live oral) the person received for the primary series.

! **Oral (Ty21a) typhoid vaccin**e is inhibited by various antibiotics and by mefloquine (for malaria prophylaxis). Vaccination with Ty21 a should be delayed for at least 24 hours after administration of these drugs.

! **Hepatitis A vaccine requires** 4 weeks to produce an adequate immune response. If travel will begin in less than 4 weeks, traveler should be given IG in addition to hepatitis A vaccine.

! Whole cell **pertussis vaccin**e is not recommended for persons >7 years of age.

! **Chloroquine** (for malaria prophylaxis) may reduce the response to human diploid cell rabies vaccine when the vaccine is administered intradermally.

Source: CDC. Health /information for International Travel **1995; CDC.** Genera/RecommendaVons on Immunization. **Recommendations of the Advisory Committee on Immunization Practices (ACIP). 1994.**

CDC

APPENDIX F

OCCUPATIONAL HEALTH REFERENCES AND RESOURCES

A. BIBLIOGRAPHY

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2. General References - Department of the Navy Publications

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OPNAVINST 5100.23 series. Chapter 17, ***Asbestos.***

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International Labour Office. ***Guidelines for the Use of ILO International Classification of Radiographs of Pneumoconioses.*** **Occupational Safety and Health Series, No. 22 (revised). Geneva: International Labour Office, 1980.**

b. <u>Cadmium</u>

29 CFR 1910.1027. ***Cadmium standard for General Industry.***

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(Provides information concerning adverse health effects from cadmium exposure and the reasons for decisions made regarding the requirements of the standard).

c. <u>Formaldehyde</u>

29 CFR 1910.1048. ***Formaldehyde.***

d. <u>Hearing Conservation</u>

29 CFR 1910.95. ***Occupational Noise Exposure.***

DODINST 6055.12. ***Hearing Conservation Program*****, 22 Apr 96.**

NAVMEDCOMINST 6260.5*, Occupational Noise Control and Hearing Conservation*. 26 April 84.

OPNAVINST 5100.23 series. ***Navy Occupational Safety and Health Program Manual*****. Chapter 18, Hearing Conservation and Noise Abatement.**

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DD 2215, Reference Audiogram, S/N 0102-LF-002-2151

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DD 2217, Biological Audiometric Calibration, S/N 0102-LF-002-2170

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29 CFR 1910.1025, *Lead (As Amended).*

OPNAVINST 5100.23 series. Chapter 21, *Lead.*

OPNAVINST 5100.19 series. Chapter B10, *Lead Control Program.*

f. Manmade Vitreous Fibers

NEHC-TM-91-1. *Manmade Vitreous Fibers.*
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BUMEDINST 6470.19. *Laser Safety for Medical Facilities.* 24 Aug 90.

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5. References for Job Certification Examinations

a. <u>Sight Conservation</u>

OPNAVINST 5100.23 series. Chapter 19. ***Sight Conservation.***

OPNAVINST 5100.19 series. Chapter B5. ***Sight Conservation Program.***

b. <u>Competence For Duty</u>

BUMEDINST 6120.20B. ***Competence for Duty Examinations, Evaluations of Sobriety, and Other Bodily Views and Intrusions Performed by Medical Personnel.***
28 Sep 81.

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d. <u>Chemical Holding Tank Sewage Workers</u>

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e. <u>Day Care Center Workers</u>

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OPNAVINST 1700.9B. ***Child Development Programs.*** **27 Oct 94.**

f. <u>Crane Operators</u>

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g. <u>Diver/Hyperbaric Workers</u>

NAVMED P-117. ***Manual of the Medical Department,*** **Chapter 15.**

h. <u>Explosive Ordnance Handlers/Drivers</u>

49 CFR Parts 391.41 through 391.49. ***Physical Qualifications for Drivers.***

NAVSEA OP-2239.

NAVMED P-117. Manual of the Medical Department, Chapter 15.

i. Firefighters

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Qualification Standards Handbook for General Schedule Positions.

j. Firefighter Instructors

NAVMED P-117. *Manual of the Medical Department*, Chapter 15.

k. Forklift Operators

NAVFAC P-306, Chapter 1.

l. Hazardous Material Spill Response Team

29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response.*

m. Motor Vehicle Operators

49 CFR 391.41-49.
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Federal Personnel Manual, Chapter 930, Appendix A.
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n. Naval Criminal Investigative Service

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B. OCCUPATIONAL HEALTH AND SAFETY AGENCIES

Centers for Disease Control Prevention (CDC)
1600 Clifton Road, NE
Atlanta, GA 30333

CDC is charged with protecting the health of the population and responding to public health emergencies. It administers national programs for the prevention and control of communicable diseases and collects, analyzes, and disseminates national data on health status and health services.

Agency for Toxic Substances and Disease Registry (ATSDR)
1600 Clifton Road, NE
Atlanta, GA 30333

ATSDR is a U.S. Public Health Service agency created under the Comprehensive Environmental Response and Compensation Act of 1980 (also known as Superfund). Its mission is to prevent exposure and adverse human health effects and diminished quality of life associated with exposure to hazardous substances from waste sites, unplanned releases and other sources of environmental pollution.

The Division of Toxicology,(404) 639-6300, publishes "Fact sheets on hazardous substances" and "Toxicological profiles". The Division of Health Education, (404) 639-6205, publishes "Public health statement notebooks" which contain the public health statements on 80 hazardous substances.

Environmental Protection Agency (EPA)
401 M Street, SW
Washington, DC 20460

EPA was mandated by the 1974 Safe Drinking Water Act to establish water standards and ensure their enforcement. The EPA is responsible for assessment and control of air and water pollution, solid waste management, pesticides, radiation, noise, toxic substances, and other environmental problems.

National Cancer Institute (NCI)
National Institutes of Health
Public Health Service
U.S. Department of Health and Human Services
Bethesda, MD 20205

NCI publishes/distributes the annotated bibliography Cancer Information in the Workplace and free educational materials. NCI supports research related to occupational cancer hazards and applied prevention programs to minimize potential hazards for workers.

National Institute of Environmental Health Sciences (NIEHS)
National Institutes of Health
Public Health Service
U.S. Department of Health and Human Services ,
P.O. Box 12233
Research Triangle Park, NC 17709

NIEHS is the principal federal agency responsible for research on the effects of chemical, physical, and biological environmental agents on human health and well-being.

National Institute for Occupational Safety and Health (NIOSH)
4676 Columbia Parkway
Cincinnati OH 45226

NIOSH represents the research arm of the Occupational Safety and Health Act of 1970. Based in the Public Health Service (under DHHS), NIOSH responsibilities include research on occupational safety and health problems as well as on psychological factors as they relate to occupational safety and health; training occupational safety and health professionals; hazard evaluation and toxicity determinations; work force development and training; and industry-wide studies on chronic or low-level exposures to hazardous substances. The NIOSH Publications Catalog lists all NIOSH publications, including criteria documents, manuals, reports, health hazard evaluations, and others.

Occupational Safety and Health Administration (OSHA)
U.S. Department of Labor
200 Constitution Avenue, NW
Washington, DC 20210

OSHA is the federal agency responsible for the regulatory functions of the Occupational Safety and Health Act of 1970. OSHA responsibilities include development and updating of mandatory occupational safety and health standards; enforcing regulations and standards; requiring employers to keep accurate records on work related injuries, illnesses, and hazardous exposures; collecting and maintaining occupational safety and health statistics in conjunction with NIOSH; and supervising employer and worker education and training to identify and prevent unsafe or unhealthy working conditions (in conjunction with NIOSH).

OSHA Publications and Audiovisual Programs, OSHA 219, provides an overview of publications on OSHA standards-related topics. Free copies may be obtained from telephone (202) 219-4667, or the nearest OSHA regional or area office.

C. COMPUTERIZED DATABASES

The Centers for Disease Control and Prevention (CDC) publishes a document listing publicly available sources of computerized information on environmental

health and toxicology. This may be obtained from the Information Resources Management Group, telephone 404-488-7215.

Occupational Safety and Health (OSHA) CD-ROM discs contain the text of all OSHA standards. Subscribers receive quarterly updates. Subscriptions may be ordered from the Government Printing Office, telephone 202-783-3238.

National Institute for Occupational Center and Health Technical Information Center (NIOSHTIC) Database covers toxicology, epidemiology, industrial hygiene practices and other areas of occupational health and safety. This file is updated quarterly and is available on-line (DIALOG, telephone 1-800-334-2654) and on CD-ROM (Silver Platter OSH-ROM, telephone 1-800-343-0064).

REPROTOX provides summaries of articles on the reproductive effects of hundreds of chemical substances. Use of the database (online) is included with membership in the Reproductive Toxicology Center, telephone 202-293-5137.

The National Library of Medicine (NLM) includes the following databases:

1. MEDLINE includes citations from biomedical journals published in the U.S. and abroad.

2. RTECS (Registry of Toxic Effects of Chemical Substances) is the NLM online version of the NIOSH annual compilation of substances with toxic activity.

3. TOXLINE (Toxicology Information Online) covers toxicological, pharmacological, biochemical and physiological effects of chemicals.

4. TOXNET (Toxicology Data Network) is a computerized system of toxicology oriented databanks managed by the NLM.

The following databases are available on STN (Scientific and Technical information Network) which is produced by Chemical Abstracts Service.

1. BIOSIS (Biological Abstracts) covers original research reports and reviews of broad topical interests, such as toxicology and pathology.

2. CA (Chemical Abstracts) covers all areas of chemistry and chemical engineering.

3. CHEMLIST (Regulated Chemicals Listing file) contains information about chemical substances listed on the EPATSCA (Environmental Protection Agency Toxic Substances Control Act) Inventory or those subject to regulations under the Toxic Substances Control Act or similar legislation.

4. CSNB (Chemical Safety News Base) provides access to chemical information related to fire, explosions, transport, toxic substances, studies on laboratory animals, waste removal, and other subjects related to health and safety.

D. TELEPHONE SERVICES

Centers for Disease Control and Prevention (CDC) (404) 332-4555. The CDC Voice Information System is an automated telephone service that provides information about public health topics. This includes an overview of each topic, symptoms, prevention methods, immunization requirements if any, and an option for transfer to a public health professional during business hours.

CHEMTREC (1-800) 424-9300. This is operated by the Chemical Manufacturers'

Association. Call this hotline if a chemical spill has occurred. The information will be relayed to the manufacturers who can then determine the contents of the spilled container and suggest appropriate action for containment.

National Institute for Occupational Safety and Health (NIOSH) (1-800) 35-NIOSH. This provides technical assistance on workplace hazards.

OSHA Technical Support Services (202) 523-7031. This provides rapid technical support, as well as the phone numbers of regional technical support offices for additional assistance.

Poison Control Centers. Each state or region has its own 24-hour poison control center hotline which provides expert emergency medical information and referrals. The number may be found in the telephone directory, or by calling 911, or (1-555-1212) and asking for the local Poison Control Center.

APPENDIX G

DEFINITION OF TERMS

References

20 CFR Part 10. Federal Employees' Compensation Act.

20 CFR Part 701. Longshoremen's and Harbor Workers' Compensation Act and Related Statutes.

Definition of Terms

Benefits or Compensation (FECA) means the money paid or payable under the Act to the employee on account of loss of wages or loss of wage-earning capacity, and to enumerated survivors on account of the employee's death, and includes any other benefits paid for from the Employee's Compensation fund such as scheduled compensation under 5 U.S.C. 8107, medical diagnostic and treatment services supplied pursuant to the Act and this part, vocational rehabilitation services, additional money for services of an attendant or for vocational rehabilitation under 5 U.S.C. 8111, and funeral expenses under 5 U.S.C. 8134, but does not include continuation of pay as provided by 5 U.S.C. 8118.

Continuation of Pay (COP) (FECA) means continuation of an employee's regular salary for up to 45 calendar days of wage loss due to disability and/or medical treatment following a traumatic injury. The intent of this provision is to eliminate interruption of the employee's income while the Department of Labor's Office of Workers' Compensation Program (OWCP) is processing the claim. COP is not considered compensation and is therefore subject to deductions for income tax, retirement, etc.

Controvert (FECA) means to dispute, challenge, or deny the validity of a claim for workers' compensation and/or claim for COP. Unless the employing agency controverts the claim for one of the reasons listed below, the employee is entitled to COP for up to 45 calendar days of disability. The employing agency must continue the employee's pay unless the controversion is based on one of the nine reasons listed on the back of the Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation (Form CA-1).

Disability (FECA) means incapacity because of injury to earn the wages which the employee was receiving at the time of injury in the same or any other employment; but such term shall mean permanent impairment, determined (to the extent covered thereby) under the guides to the evaluation of permanent impairment promulgated and modified from time to time by the American Medical Association, in the case of an individual whose claim is described in section 910(d)(2) of this title (33 U.S.C.).

Impairment (FECA) means any anatomic or functional abnormality or loss. A permanent impairment is any such abnormality or loss after maximum medical improvement has been achieved.

Injury (FECA) means wound or condition of the body induced by accident or trauma, and includes a disease or illness proximately caused by the employment for which benefits are provided under the Act. The term "injury" includes damage to or destruction of medical braces, artificial limbs, and other prosthetic devices which shall be replaced or repaired; except that eyeglasses and hearing aids shall not be replaced, repaired, or otherwise compensated for, unless the damage or destruction is incident to a personal injury requiring medical services.

Injury (LHWCA) means accidental injury or death arising out of and in the course of employment, and such occupational disease or infection as arises naturally out of such

employment or as naturally or unavoidably results from such an accidental injury and includes an injury caused by the willful act of a third person directed against an employee because of his employment.

Occupational disease or illness (FECA) means a condition produced in the work environment over a period longer than a single workday or shift by such factors as systemic infection; continued or repeated stress or strain; or exposure to hazardous elements such as, but not limited to, toxins, poisons, fumes, noise, particulates, or radiation, or other continued or repeated conditions or factors of the work environment.

The term physician (FECA) includes surgeons, podiatrists, dentists, clinical psychologists, optometrists, osteopathic practitioners, and chiropractors within the scope of their practice as defined by State law. Under FECA, the services of chiropractors may be reimbursed only for treatment consisting of manual subluxation as demonstrated by X-ray to exist. The term "subluxation" is defined as an incomplete dislocation, off-centering, misalignment, fixation or abnormal spacing of the vertebrae anatomically which must be demonstrable on any X-ray film to individuals trained in the reading of X-rays.

Temporary aggravation (FECA) means that factors of employment have directly caused an underlying or pre-existing condition, disease or illness to be more severe for a definite limited period of time and thereafter leaves no greater impairment than existed prior to the employment injury.

Traumatic injury (FECA) means a wound or other condition of the body caused by external force, including stress or strain, which is identifiable as to time and place of occurrence and member or function of the body affected. The injury must be caused by a specific event or incident or series of events or incidents within a single work day or workshift.

SAMPLE PROTOCOL FOR INJURED WORKERS

- Injured worker reports to supervisor. (CA-1 initiated)

- Supervisor: 1. Arranges appropriate transportation for employee i.e. ambulance, government vehicle or privately owned vehicle, to occupational health (OH) unit or medical treatment facility (MTF).

2. Notifies Safety of injury. (Safety notifies ICPA)

- OH unit or MTF provides assessment, emergent care and documentation of injury including history of injury.

- OH or MTF offers treatment of injury.

<u>If employee elects care from OH unit or MTF</u>:

* Care provided to the extent of the MTF capabilities; OH unit provides follow-up on referrals to other departments.

* OH forwards copy of the Dispensary Permit to supervisor and Safety, and a copy of the pertinent entry on the SF600 to ICPA after each visit. Supervisor calls OH unit to clarify any questions.

* Worksite visit by OH unit to determine appropriate work limitations.

<u>If employee elects care from private physician</u>:

* OH unit calls private physician for appointment.

* OH provides CA-17, command light duty packet and a copy of the initial assessment to private physician.

* OH unit forwards copy of the Dispensary Permit to supervisor and Safety, and a copy of the pertinent entry on the SF600 to ICPA.

* OH provides support to ICPA to clarify medical documentation received from the private physician.

* Employee reports to OH unit upon return to work. OH unit provides follow-up and clarification of limitations.

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